

# Economic Contribution of the Agricultural Sector to the Arkansas Economy in 2007 *and Revised Estimates for 2006*



Nathan Kemper, Jennie Popp,  
and Wayne Miller

ARKANSAS AGRICULTURAL EXPERIMENT STATION

Division of Agriculture

December 2009

University of Arkansas

Research Report 987

Technical editing and cover design by Gail Halleck.

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Arkansas Agricultural Experiment Station, Division of Agriculture, University of Arkansas, Fayetteville. Milo J. Shult, Vice President for Agriculture; Mark J. Cochran, AAES Director and Associate Vice-President for Agriculture–Research. WWW/InddCS3.  
The University of Arkansas Division of Agriculture follows a nondiscriminatory policy in programs and employment.  
ISSN: 1539-5944 CODEN: AKABA7

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**Nathan Kemper  
Jennie Popp  
Wayne Miller**

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

\* Nathan Kemper is a Program Associate and Jennie Popp is an Associate Professor and in the Department of Agricultural Economics and Agribusiness in Fayetteville; Wayne Miller is a Professor with the University of Arkansas Division of Agriculture, Cooperative Extension Service in Little Rock, Ark.

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## Executive Summary

Agriculture and associated agricultural activities are major contributors to the Arkansas economy. Agriculture is defined as the sum of agricultural production and processing activities, unless otherwise specified, and includes crop and animal production and processing, agricultural support industries, forestry and forest products, and textile goods. Agriculture contributes to the economy through direct agricultural production and value-added processing, and also leads to economic activity in other parts of the economy.

This report is the fourth in a series of reports examining agriculture's economic contribution on the Arkansas economy. Utilizing data from the United States Bureau of Economic Analysis, USDA Economics Research Service, USDA National Agricultural Statistics Service, and Minnesota IMPLAN Group, Inc., the economic contribution of agriculture on the Arkansas economy was estimated for the most recent year available, 2007. Gross Domestic Product (GDP) by State information for Arkansas was compared with those of other states in the southeast U.S. to give a measure of the relative importance of agriculture in Arkansas. The total economic contribution of agriculture (direct, indirect, and induced effects) on value added, employment, and labor income was estimated by employing the Impact Analysis for Planning System (IMPLAN). Government payments are not included in induced contributions of farm production. The economic contributions of agricultural production and processing were estimated for agriculture as a whole and also separately for the Crops Sector, the Animal Agriculture Sector, and the Forestry Sector. Key findings of the IMPLAN analysis are as follows:

- When comparing the GDP contributions of agriculture, forestry and many food related industries, Arkansas agriculture accounts for a larger percentage of total economic activity in the state than any other state in the Southeastern US – 12% of total GDP by State or \$10.6B.<sup>1</sup>
- Agriculture contributed \$15.2B in total value to the state economy; roughly \$0.16 of every \$1 in value generated in the state.
- Agriculture accounted for 268,617 jobs, which is 17% of all jobs in the state. Direct employment in agriculture is 161,140 or 10% of all state employment.
- Poultry production and processing alone continued to provide over one in four of the state's agricultural jobs.
- Agriculture paid \$9.2B in labor income, or over 15% of the state's total labor income; directly, agriculture payrolls total \$7.5B, or over 14% of state wages total.
- Agriculture generates value added, employment, and income in all 20 of the 2-digit NAICS aggregated industries in the state. Roughly 48% of agriculture's contribution to value added occurs in industries closely tied to agriculture but not defined as part of the Agriculture Sector, such as Wholesale and Retail Trade, Transportation and Warehousing, and Health and Social Services.
- The direct contribution of the Crops Sector included \$2.8B in value added, 59,314 jobs and \$1.7B in labor income. Grain Farming, Oilseed Farming, and Cotton Farming together represented 63% of jobs, 42% of labor income, and 51% of value added in the Crops Sector.
- In direct contributions, the Animal Agriculture Sector generated \$2.3B in value added, 57,610 jobs and \$1.6B in labor income. The Poultry and Egg Production and the Poultry Processing Sectors provided 71% of jobs, 80% of income and 74% of value added in the Animal Agriculture Sector.
- The direct contribution of the Forestry Sector included \$2.8B in value added, 33,259 jobs, and \$1.6B in income. Within the Forestry Sector, Sawmills, Logging, and Paper and Paperboard Mills contribute 46% of forestry jobs, and over half of forestry income and value added.

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<sup>1</sup>This report presents two economic analyses of the agricultural sector in Arkansas. The analyses have separate and distinct scopes, definitions, and methodologies and the results of each analysis should not be compared as they are different measures of economic contribution. Please see the Definitions, Methods and Styles section for more.

Arkansas' Agricultural Sector continues to be a critical component of Arkansas' economy. Agriculture in Arkansas contributes a larger share to the state's economy than does agriculture in the neighboring Southeast states and the US. Including multiplier effects, agriculture generates over one in six jobs and 16% of value added in the state. The diversity of the state's agriculture helps to mitigate the effects of low world market prices or trade embargoes for a particular commodity. Crops, Animal Agriculture, and Forestry production and processing are all major contributors to agriculture and to the state's economy. The large and diverse natural resource base of the state provides the opportunity for agriculture to change and develop new value added and bio-energy industries. The size and diversity of the state's agriculture contribute greatly to the well-being of Arkansans and to the stability of the state's economy.

# Definitions Methods, and Styles

## Agricultural Sectors

**Aggregate Agriculture** consists of the Crops, Animal Agriculture, and Forestry Sectors' production and processing industries, plus other agriculture-related industries. See Appendix B, Tables 1-4 for complete listing of the sectors included.

**Crops Sector** comprises those industries directly involved in crop production and processing. See Appendix B, Table 1 for a complete listing of the industries included.

**Animal Agriculture Sector** comprises those industries directly involved in livestock production and processing. See Appendix B, Table 2 for a complete listing of the industries included.

**Forestry Sector** comprises of those industries directly involved in forestry production and processing. See Appendix B Table 3, for a complete listing of the industries included.

**Agriculture Related Sector** comprises those industries that support the Crops, Animal Agriculture, and Forestry sectors. See Appendix B, Table 4 for a complete listing of the industries included.

## Economic Contribution

The **total economic contribution** of the Agriculture Sector includes three areas of wealth and job generation:

**Employment** includes all wage and salary employees, as well as self-employed workers in a given sector.

**Labor Income** consists of two parts. First is proprietary income, which includes all income received by self-employed individuals including private business owners, doctors, lawyers, etc. Second is wages, which includes all worker salaries, payments, and fringe benefits paid by employers.

**Value Added** includes labor income plus indirect taxes and other property-type income such as payments for rents, royalties, and dividends. Value added and Gross Domestic Product (GDP) are equivalent measures in theory but are estimated using different methods and data sources.

**Government Payments** are payments made directly to some in the farm sector. They are included in these contributions.

**Food Services and Drinking Places** are included in the GDP comparisons among southeast states, but not as direct contributions when computing the total economic contribution of the agriculture. No input providers (fertilizer, pesticide and equipment manufacturers) or retail locations (restaurants, grocery stores, lawn and garden centers, etc.) are considered as part of the Agriculture Sector in the Value-Added estimates.

**Direct Contributions** are the sum of the contribution of farm production and processing of farm products. Only direct contributions are reported for the Crops, Animal Agriculture and Forestry Sector discussions.

**Indirect Contributions** result when agricultural firms purchase raw materials and services from other Arkansas businesses to produce their products.

**Induced Contributions** result when employees of agricultural firms and employees of the raw material and service firms spend a portion of their income on local purchases. Government payments are not included in the calculation of the induced contribution.



## Methods

For the GDP by State portion of this report, the most recent estimates from the Bureau of Economic Analysis for Agricultural production, processing and retail are reported. BEA definitions in the GDP by State data set included as part of agriculture production and processing are: 1) Agriculture, Forestry, Fishing, and Hunting, 2) Wood Product Manufacturing, 3) Furniture and Related Products Manufacturing, 4) Food Manufacturing, 5) Textile and Textile Product Mills, 6) Apparel, Leather and Allied Products Manufacturing, and 7) Paper Manufacturing. Agriculture retail in the GDP by State data set is the Food Services and Drinking Places industry. It is important to note that the agriculture retail industry is reported in the GDP portion of this report but is not included in the economic contribution analysis portion of this report. No input providers (fertilizer, pesticide and equipment manufacturers) or retail locations (restaurants, grocery stores, lawn and garden centers, etc.) are considered as direct contributors of the Agriculture Sector in the contribution analysis. However, much or some of the economic activity in these firms is picked up as indirect and induced effects and reported as part of the total economic contribution. For the GDP portion of the report, the Aggregate Agriculture Sector made up of the seven BEA sectors defined above, is referred to as the Agriculture and Food Sector. This terminology is used to emphasize the important differences in what is being measured in the GDP portion of this report in comparison to the economic contribution analysis portion.

For economic contribution analysis of the Agriculture Sector, the entire measure of economic activity in the industries that make up the Agriculture Sector (such as Crop, Livestock and Forestry production and processing industries) are considered to be 100% Agriculture. This is the basic rule for inclusion/exclusion of industries as part of the Agriculture Sector. The Agriculture Sector is made up of three kinds of industries: agriculture production industries, agriculture processing industries, and agriculture related industries. The version 2.0 IMPLAN model was used for the contribution analysis portion of the report. The IMPLAN agriculture production sectors (1-16) data must be verified prior to analysis and often require updating. The default IMPLAN output data for these sectors is checked against the latest available value of production estimates and cash receipts estimates from the United States Department of Agriculture's National Agricultural Statistics Service (NASS) and Economic Research Service (ERS). In any agriculture production industry where a data discrepancy exists, the default output data must be changed to reflect the NASS/ERS output estimate. Accordingly, a corresponding change must be made to all four components of Total Value Added. This holds the relationship between Total Industry Output and Total Value Added (a fundamental relationship in I-O analysis) constant, and the model production functions are left unchanged.

The 2007 IMPLAN data were different from previous releases in two important ways. First, the number of sectors went from 509 to 440. The IMPLAN sectors conform to the 2007 North American Industry Classification Scheme (NAICS) definitions. As a result, some sectors defined as agriculture in previous reports were combined or aggregated into larger sectors; additionally, some new sectors were created. Overall, the number of agriculture sectors in our model decreased but with the new 2007 data we actually include some activity not included in the 2003 and 2006 data year studies. In the 2007 study, our definition of the Agriculture Sector in the IMPLAN model (which uses NAICS industries) is in line with the sectoring scheme used by BEA in the GDP by State data set (also NAICS industries) for 1) Agriculture, Forestry, Fishing, and Hunting, 2) Wood Product Manufacturing, 3) Furniture and Related Products Manufacturing, 4) Food Manufacturing, 5) Textile and Textile Product Mills, 6) Apparel, Leather and Allied Products Manufacturing, and 7) Paper Manufacturing. Second, the 2007 IMPLAN model incorporates BEA's new Benchmark Input-Output (I-O) Accounts of the U.S. Economy for 2002. These I-O accounts are released every 5-years and provide an extensive accounting of the production of goods and services by industry and commodity, which includes the goods and services purchased by each industry, the income earned in each industry, and the distribution of sales for each good and service to industries and final users. These changes represent important improvements over previous studies; however, comparisons between this study and past studies are not possible. For this reason, the 2007 report will include revised estimates for 2006.

## Style Notes

This report consists of two parts. In the first part, information about Arkansas agriculture is presented in a historical context. In the second part the contributions of agriculture on the Arkansas economy are presented for two years, 2006 (revised estimates) and 2007. Throughout the report, agriculture is defined in terms of agricultural sectors, 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** comprise the areas of agriculture focus in our study. These sectors are capitalized throughout the report. The first part of the report refers to the overall Agricultural Sector. In the second part of the report we refer to the four areas of analysis: Crops Sector, Animal Agriculture Sector, Forestry Sector, and Aggregate Agricultural Sector.

**NAICS Sectors.** The North American Industry Classification Scheme (NAICS) is "...an industry classification system used by statistical agencies to facilitate the collection, tabulation, presentation, and analysis of data relating to establishments....Under

NAICS, an establishment is classified to one industry based on its primary activity” (USCB, 2006). Agricultural activities are classified under, or can impact, multiple Super Sectors. Throughout the document, capitalization of sectors is used when referring to NAICS sectors. Examples include Food Manufacturing, Paper Manufacturing, and Wood Product Manufacturing.

**Industries** are individual industries that can be aggregated to create NAICS sectors or the Agricultural Sectors used in our analysis. These industries are capitalized and italicized. Examples include *Poultry and Egg Production and Paperboard Mills*.

**Gross Domestic Product by State, formerly Gross State Product**, is the state equivalent of the national measure of gross domestic product (GDP), the most comprehensive measure of U.S. economic activity. GDP by State is derived as the sum of the GDP originating in all the industries in a state (USDC, BEA, 2008). Revisions to the Bureau of Economic Analysis estimates of GDP by State for 2005-2007 estimates by NAICS industry were completed and released in June 2009; therefore, some of the values previously reported in Popp et al. (2007) have changed. In the past, our GDP by State discussions have been limited to agricultural production and processing components. For the past two years, two additional NAICS industries were included to bring this study in line with the new methodology used by ERS to measure Agriculture and Food’s contribution to GDP (USDA, ERS, 2008a). One NAICS industry was added to the Agricultural Processing sector, (Apparel, Leather and Allied Products Manufacturing) and the new sector Agricultural Retail was added and consists of the NAICS industry Food Services and Drinking Places. It is important to note that Agriculture Retail is included as a direct effect in the GDP by State portion of the report, but not in the contribution analysis. Some retail activity is picked up as part of the induced effect and included in the total economic contribution.

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

# The Economic Contribution of Agriculture in Arkansas

## Introduction

Agricultural production, processing and support industries are major contributors to the Arkansas economy. While agriculture contributes to the economy through direct agricultural production, value-added processing, and agricultural services and support activities, 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 the Arkansas state economy.

This report:

- compares the relative size of the Agriculture and Food Sector in Arkansas and those of neighboring states, the Southeastern region of the United States, and the nation;
- provides an overview of Arkansas' economy and discusses Arkansas' Agricultural Sector in relation to the state economy;
- examines components of agricultural production and processing, including a review of historical sales trends for raw and processed agricultural output;
- compares contributions of agriculture to the Arkansas economy in 2006 and 2007 and discusses possible reasons for these changes over time; and
- discusses the overall economic contribution of agriculture to Arkansas' economy, considering the direct, indirect, and induced effects of the Agricultural Sector in 2006 and 2007.

This report builds upon previous reports (Goodwin et al., 2002; Popp et al., 2005, 2007). This report utilizes data for 2007, the most recent year for which all relevant data are available. All dollar values are expressed in 2007 constant dollar terms, unless otherwise noted.

### **A Note Regarding Presentation of Gross Domestic Product By State (formerly Gross State Product) Estimates**

Early reports (Goodwin et al., 2002; Popp et al., 2005) made comparisons of historical gross state product (GSP) data from the Bureau of Economic Analysis (BEA) from 1986 to present. 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. GDP 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. Additionally, the NAICS-based GDP by State estimates are consistent with US gross domestic product (GDP), while the SIC-based GSP estimates were consistent with US gross domestic income (GDI). The data discontinuity affects the dollar values, industry categories - particularly with respect to manufacturing components - (see Appendix A for changes relevant to the discussion of agriculture) and the growth rates of the GDP by State estimates. The BEA strongly cautions analysts using the GDP by State estimates against appending the two data series in an attempt to construct a single time series of GDP by State estimates for 1977 to the present (USDC, BEA, 2009a). Due to these reasons, following Popp et al. (2007), this study reports only GDP by State estimates since 1997.

## Agriculture and Food – The Regional Context

In the following Gross Domestic Product by State (GDP) discussion, the Agriculture and Food Sector is defined as the sum of agricultural production, processing and retail, unless otherwise mentioned. Arkansas' Agriculture and Food Sector, expressed as a percentage of total GDP (previously termed GSP), has exceeded those of contiguous states since at least 1969, when the BEA began publishing regional GDP information. In 2007, the Agricultural Sector accounted for of Arkansas' GDP (Table 1) as compared to 11.7% in 2006; Agriculture and Food in the Southeast region experienced a 0.1% drop as a percentage of GDP from 2006 to 2007 (in terms of Real GDP). Still, Arkansas' agricultural production, processing and retail as percentage of GDP is well over two times greater than that of the United States' (US) agricultural sector as a percentage of its Gross Domestic Product in 2007.

The individual contributions of agricultural production and processing also comprise a greater percentage of Arkansas' GDP than agricultural production and processing do in neighboring states' and the nation's respective econo-

**Table 1. The Agriculture and Food Sector as a Percentage of GDP, 2007<sup>a</sup>**

State / Region	Percent of GDP by state
Arkansas	12.03
Louisiana	4.55
Mississippi	9.19
Missouri	7.09
Oklahoma	5.46
Tennessee	6.68
Texas	4.28
Southeast <sup>b</sup>	6.94
U.S. <sup>c</sup>	5.50

Source: USDC, BEA (2009b)

<sup>a</sup> Current 2007 dollars

<sup>b</sup> The BEA includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi,

North Carolina, South Carolina, Tennessee, Virginia, and West Virginia in the Southeast region

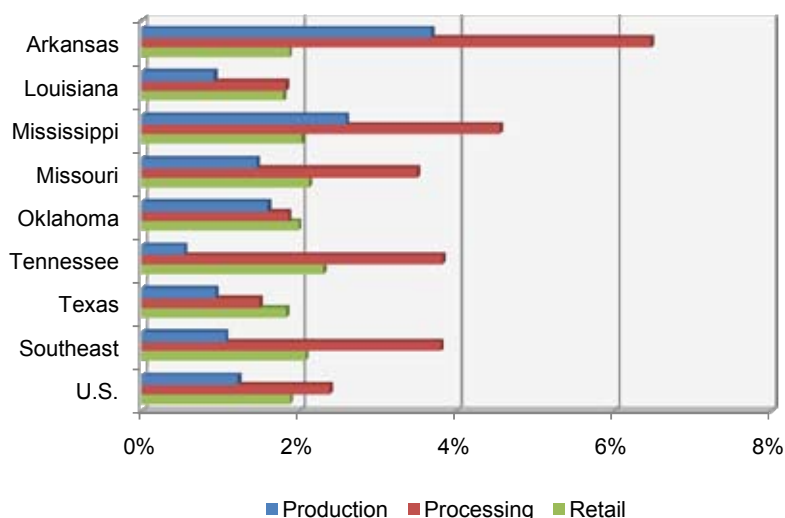
<sup>c</sup> Agriculture and food is measured as a percent of GDP for the U.S.

mies (Figure 1). Agricultural production contributed 3.7% to Arkansas' GDP in 2007, whereas agricultural production in Mississippi, the Southern State whose contribution comes closest to Arkansas', contributed only 2.6% to its GDP. Similarly, agricultural processing's contribution to GDP in Arkansas is 6.5% whereas it is only 4.6% in Mississippi. However, Arkansas' agricultural retail contributed only 1.9% to Gross Domestic Product by

State, behind Tennessee (2.3%), Missouri (2.1%), Oklahoma (2.0%) and Mississippi (2.0%).

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. Arkansas is one of the top 25 states in the production of twenty different agricultural products (USDA, NASS, 2008). Arkansas is the leading producer of rice, the second leading producer of broilers, the third leading producer of cotton, cottonseed and catfish, and the fourth largest producer of turkey (USDA, NASS, 2008). Arkansas also has a large percentage of forestland, equal to 54% of its total land base (Arkansas Forest Resources Center, 2009), where relatively low-valued timber is processed to produce higher-valued products (e.g., lumber, paper, and furniture). Note that in Figure 1, states that are more than 50% forested, including Arkansas, Mississippi, and Tennessee, tend to have high values of agricultural processing. Oklahoma, the only state contiguous to Arkansas with a lower value of agricultural processing than production, is only 17% forested (American Forest and Paper Association, 2009).

**Figure 1. Production, Processing and Retail as a Percentage of GDP, 2007<sup>a</sup>**



Source: USDC, BEA (2009b)

<sup>a</sup> Current 2007 dollars

<sup>b</sup> The BEA includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi,

North Carolina, South Carolina, Tennessee, Virginia, and West Virginia in the Southeast region

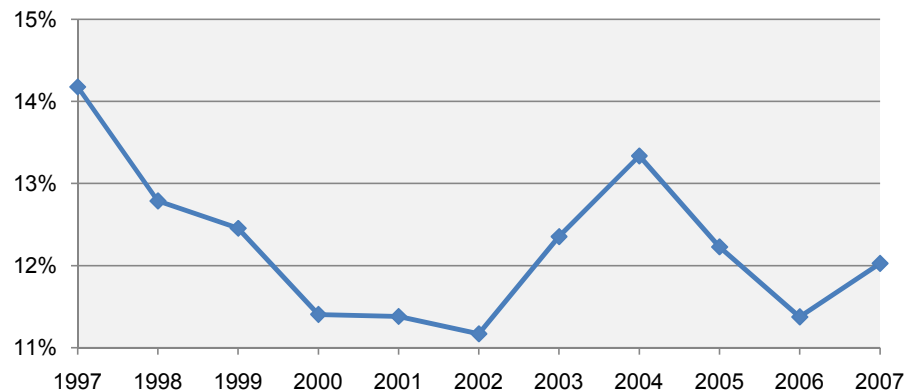
Overall, Agriculture and Food's share of total GDP in the Southeast fell between 2006 and 2007 from 7.0% to 6.9% due to increased contributions from other sectors towards GDP. However, Arkansas remains number one out of six contiguous states in terms of agricultural production, processing and retail as a percentage of GDP in 2007 and the importance of the Agriculture and Food Sector has increased in terms of its share of the total GDP from 11.7% in 2006 to 12.0% in 2007.

### Agriculture and Food and the Arkansas Economy

In 2007, Arkansas' total GDP was equal to \$95.1B (constant 2007 dollars are used throughout this section, unless otherwise noted) (USDC, BEA, 2008) with the Agriculture and Food Sector contributing \$11.4B to the total (Figure 2). From 1997 to 2007, Agriculture and Food's lowest contribution to GDP was \$9.2B in 2000. During the years that followed, the Agriculture and Food Sector increased 29.9% to nearly \$12.0B in 2004 before declining to \$10.7B in 2006. The Agriculture and Food Sector rebounded in 2007 by increasing 7.3% to \$11.4B and outpaced the growth of the overall state GDP which increased only 1.5%.

The Agriculture and Food Sector represented 12.0% of the overall Arkansas GDP in 2007 compared to 11.7% in 2006 (Figure 3). In 1997, the Agriculture and Food Sector's contribu-

Figure 3. The Agriculture and Food Sector's Share of Arkansas GDP, 1997 - 2007<sup>a</sup>



Source: USDC, BEA (2009b)  
<sup>a</sup> Constant 2007 dollars

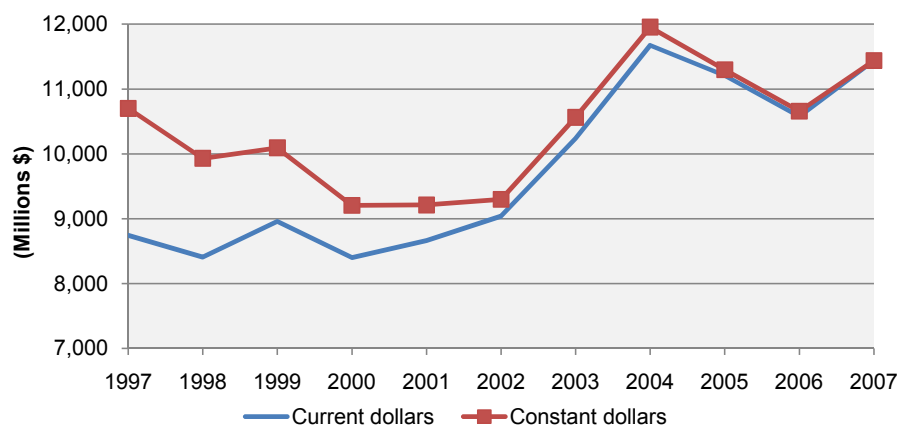
tion to GDP was 14.2%, of the overall total, the highest level from 1997 to 2007. The portion of the state GDP attributed to Agriculture and Food fell to 11.2% in 2002. Much of this loss is explained by falling prices for agricultural products between 1997 and 2002. The Agriculture and Food Sector rebounded in 2003 to 12.4% and 2004 to 13.3%. After two years of decline in 2005 and 2006, the Agriculture and Food Sector as part of Arkansas GDP was up 0.7% in 2007. The recent increase in the Agriculture and Food Sector is due in part to high commodity prices resulting from strong demand from foreign buyers and from the domestic biofuels industry (USDA, ERS, 2009).

The Agriculture and Food Sector ranks as the fourth largest sector in the state (Figure 4). The only sectors larger are Non-Agricultural Service and

Retail (19.7%), Government (13.7%), and Finance, Insurance and Real Estate (12.2%). The three major components of the Agriculture and Food Sector, agricultural production, agricultural processing and agricultural retail, totaled \$3.5B, \$6.2B, and \$1.8B GDP respectively (Figure 5). From 1997 to 2000, Agriculture and Food GDP rebounded briefly in 2001 before dropping again in 2002. In 2003 and 2004, agricultural production increased to \$4.0B the highest level from 1997 to 2004, representing an increase over 2002 of 93.2%. In 2003 and 2004 farmers experienced consecutive years of large harvests for major crops and unusually high prices for livestock and milk. This combined to create record earnings for the farm sector (USDA, ERS, 2006). Also, the declining value of the dollar in the early 2000s and the foreign accumulation of foreign exchange reserves (U.S. dollars) enabled some countries to increase food commodity imports, even as world prices denominated in dollars reached record highs (USDA, ERS, 2008b).

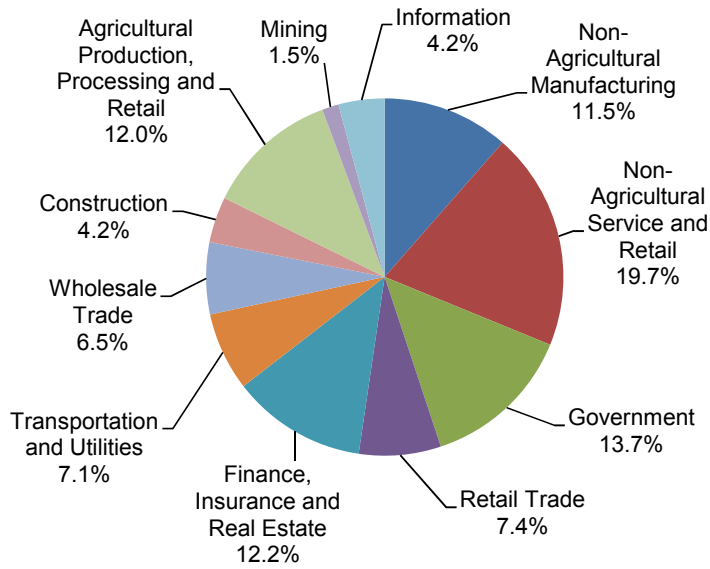
From 2001 to 2004, the GDP for agricultural processing increased 24.9% from \$5.1B to \$6.4B before declining in 2005 and 2006. Agricultural processing increased again in 2007 to \$6.2B. From 1997 to 1999, the GDP of manufacturing increased by 9.4%; however, over the following two years, it decreased by 10.8% to \$14.4B in 2001. Other than a small decrease from 2004 to 2005, the GDP of manufacturing has been on the rise since 2001, increasing 18.8% to its highest

Figure 2. Arkansas' Agriculture and Food Sector GDP, 1997 - 2007<sup>a</sup>



Source: USDC, BEA (2009b)  
<sup>a</sup> Constant 2007 dollars

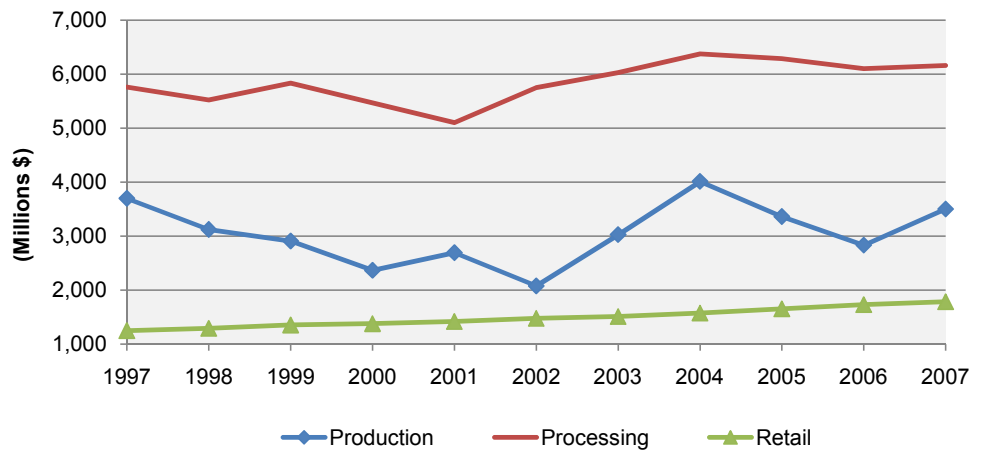
Figure 4. Sector Percentages of Arkansas' GDP, 2007<sup>a</sup>



Source: USDC, BEA (2009b)

<sup>a</sup> Current 2007 dollars

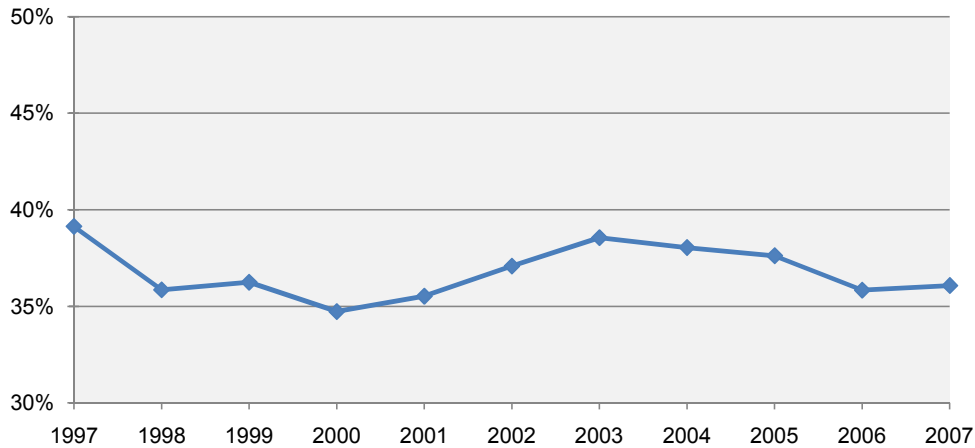
Figure 5. GDP for Arkansas' Agricultural Production, Processing and Retail, 1997 - 2007<sup>a</sup>



Source: USDC, BEA (2009b)

<sup>a</sup> Constant 2007 dollars

Figure 6. Arkansas' Agricultural Processing's Share of Manufacturing GDP, 1997 - 2007<sup>a</sup>



Source: USDC, BEA (2009b)

<sup>a</sup> Constant 2007 dollars

level at \$17.1B in 2007. From 1997 to 2001, the GDP of agricultural processing fell by 11.4% to its lowest level at \$5.1B (Figure 5). Since 2001, agriculture processing has been on an upward trend increasing to \$6.2B in GDP in 2007. This increase represented a 20.7% rise in agricultural processing, a slightly higher increase than the overall manufacturing sector. The GDP of both manufacturing and agricultural processing in 2007 were above 2006 levels; manufacturing was up 0.3% while agricultural processing was up 0.9%. This indicates that while growth was low, the GDP of agricultural processing has increased at a higher rate than other manufacturing sectors. Agricultural processing's share of the overall manufacturing sector was 36.1% in 2007, up slightly from 2006 by 0.3% (Figure 6). Since 1997, agricultural processing's share of manufacturing GDP has ranged from a low of 34.7% in 2000 to a high of 39.1% in 1997. The 11-year average is 36.8% indicating that agricultural processing has been and remains to be an important component of the manufacturing sector in Arkansas. Food Manufacturing, Paper Manufacturing, and Wood Product Manufacturing account for over 90% of Arkansas' agricultural processed goods in 2007. Each of these agriculture industries experienced different economic conditions in 2007 and will be discussed further in the "Agricultural Processing" section.

Finally, GDP in agricultural retail in 2007 was \$1.8B (Figure 5). From 1997 to 2007, agricultural retail has increased by

37.8%; there has been an increase in agricultural retail each year since 1997 and a 2.8% increase was realized from 2006 to 2007. Food service operators, including restaurants, have steadily increased their share of total food expenditures over time contributing to the steady increases in the sector. By 2006, food away from home spending by households and businesses account for almost 50% of all food spending, up from 39% in 1980, further evidence of the market forces behind the increases in agricultural retail GDP (USDA, ERS, 2008c).

### Agricultural Production

Crop and animal production, forestry, aquaculture, and horticulture are the primary agricultural production industries found in Arkansas. The GDP of agricultural production declined from \$3.7B in 1997 to \$2.1B in 2002, representing a loss of 43.9% in GDP. The growth of agricultural production's GDP stalled in these years due to low agricultural prices in the world market, especially in the Crops Sector, and barriers to poultry exports also contributed to the decline (USDA, ERS, 2008b). In 2003 and 2004, crop output and prices recovered and prices available to farmers for sales of animal agriculture and products were substantially higher, which contributed to record years for farm income. Agricultural production GDP rose to an 11-year high in 2004 of over \$4.0B. Although the value of animal agriculture production increased in 2005, the overall

value of agricultural production GDP decreased in 2005 and 2006, down to \$2.8B before a sharp rise to \$3.5B in 2007, representing a 23.6% increase over 2006. Arkansas cash receipts from all commodities in 2007 were the largest in state history. The boost in income was primarily the result of higher commodity prices.

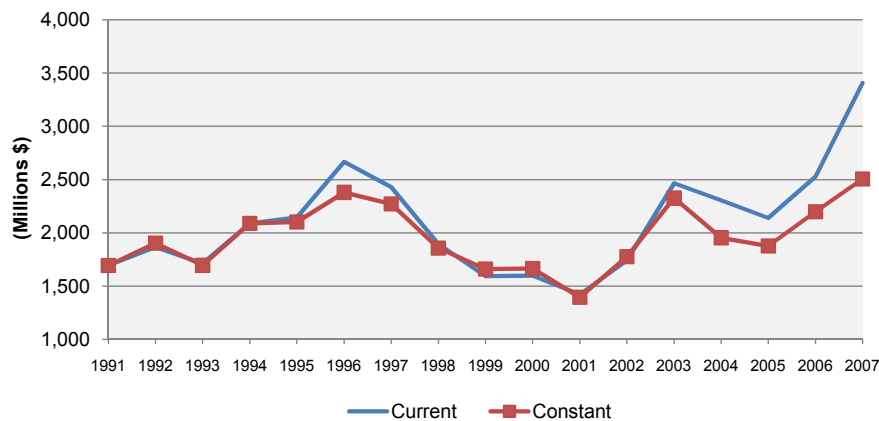
#### Crops Production

While crops production continues to be an important part of Arkansas' economy, the sales value of crops production has experienced periods of increase and decline since 1991 (Figure 7). In 2001, crop sales fell to their lowest level since 1991, down to \$1.4B. However, from 2001 to 2003 crops prices and exports, along with strong domestic and international demand for products greatly improved; as a result, the value of crops production jumped 66.7%. The gains were partly erased as the total market value (in constant 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 US; however, in Arkansas, cotton, rice and soybean output increased, but prices did not. In 2006 and 2007, Arkansas crop production sales increased a total of 33.4% to the highest level at \$3.4B.

#### Animal Production

Animal production is also a major component of Arkansas' agricultural production. In terms of real dollars, the animal production cash receipts (which measure income and sales from marketing) in Arkansas increased from \$3.5B in 2006 to \$4.1B in 2007 (Figure 8). Exports, boosted by a weak dollar and increasing global demand for protein, were responsible for much of the increases (USDA, ERS, 2009). However, when adjusted for inflation and the rising costs of farm inputs, an examination of the animal production sector in 2007 reveals that producers were actually worse off. The values of broilers, cattle and calves, eggs, turkeys, hogs and pigs, dairy products, catfish, farm chickens, and honey production constitute the animal agriculture production data found in Figure 8.

Figure 7. Arkansas' Crop Production Sales, 1991 - 2007<sup>a</sup>



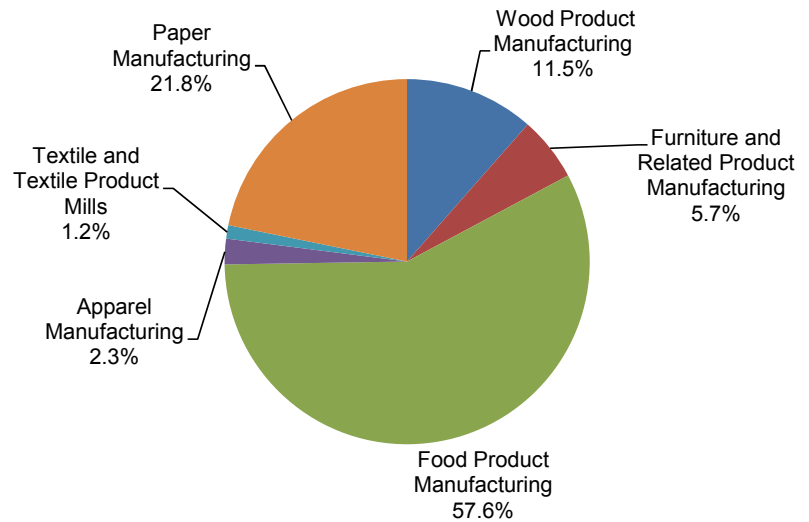
Source: Computed using data from the USDA, NASS (2009)  
 For selected crops: Rice, Soybeans, Cotton, Hay, Wheat, Corn, Sorghum, and Oats  
<sup>a</sup> Constant 1990-1992 dollars

The Animal Agriculture Sector is susceptible to changes in global agricultural policies. Instability in Russia, Japan, and Hong Kong negatively impacted trade during the late 1990s through 2002, resulting in fewer livestock purchases (particularly poultry) and depressed world prices. However, the livestock market improved greatly between 2002 and 2005; the market value of livestock increased 23% to \$3.6B (in constant 1990-1992 dollars). In constant dollars, cash receipts declined dramatically in 2006 and were down again in 2007 to \$2.98B. Production expenses, at the U.S. level, were 75 percent of the value of farm gross income in 2007 which actually represents a 5 percent improvement over 2006. Since 2002, expenses have increased at an accelerating rate, rising 15 percent from 2002 to 2007. So while on-farm cash receipts set a record in Arkansas in 2007, Figure 8 shows that increases in expenses of livestock products have outpaced increases in cash receipts for these commodities.

### Forestry Production

Arkansas is fifth in the production of softwood lumber production (Arkansas Forestry Commission, 2009) and 54% of Arkansas' land base is forested. 22,560,154 tons of timber (pine and hardwood) were removed from forests in Arkansas in 2007. Forestry production is essential to Arkansas' economy. Foresters supply wood product manufacturers with raw materials. Arkansas' timber

Figure 9. Components of Arkansas' Agricultural Processing Sector GDP, 2007<sup>a</sup>



Source: USDC, BEA (2009b)

<sup>a</sup> Current 2007 dollars

is fundamental to such industries as paper, lumber and wood, and furniture and fixtures. As will be discussed later, processed goods derived from forestry production are the third largest component of processed agricultural goods, in terms of employment, labor income, and value added.

### Agriculture-Related Industries

Agriculture-related industries include commercial fishing, hunting and trapping from the natural environment (not farm raised), and agriculture and forestry support activities (e.g., cotton ginning and crop dusting). In previous reports, on-farm construction was

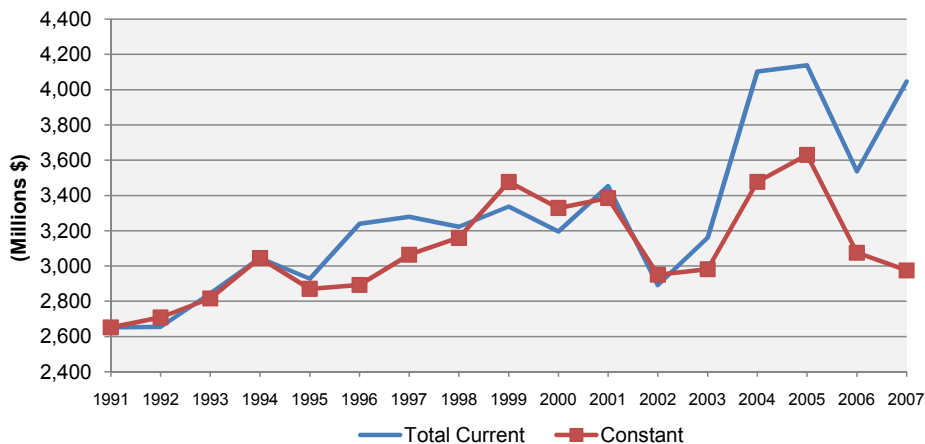
also included; however, the data are no longer available and have been dropped from the analysis. The largest of these industries is agriculture and forestry support activities. These activities may be performed by an independent firm as an input required for the production process for a given crop, animal, or forestry industry. Typical activities include but are not limited to: cotton ginning; soil preparation, planting, and cultivating; and breeding services and livestock sprayers. As will be discussed later, the support activities sector alone employed almost 11,000 in 2007.

### 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. Broiler production and processing, for example, may lead to such processed goods as frozen chicken, eggs, animal feed and animal oils; cotton production may lead to ginning and processing of materials to be used in the textile industry.

The contribution of individual agricultural processing industries to agricultural processing in 2007 is shown in Figure 9. Each industry's share of agricultural processing was relatively

Figure 8. The Value of Arkansas' Animal Agriculture Production, 1991 - 2007<sup>a</sup>



Source: Computed using data from USDA, ERS (2009b)

For selected livestock: Broilers, Cattle and Calves, Eggs, Turkeys, Hogs and Pigs, Milk, Catfish, Farm Chickens, and Honey

<sup>a</sup> Constant 1990-1992 dollars

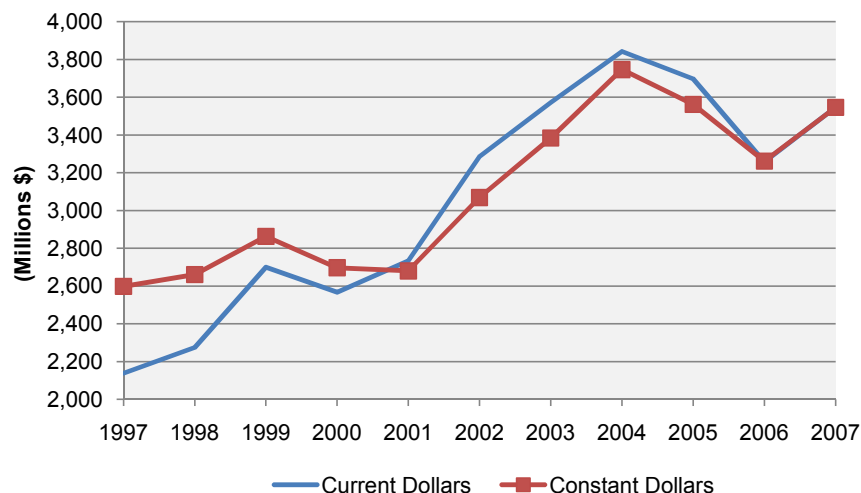


constant between 2006 and 2007. A discussion of each industry's value over time, as a percentage of GDP, follows.

**Food Product Manufacturing**

The food product manufacturing sector is the largest agricultural processing sector in Arkansas, accounting for 57.6% of agricultural processing's GDP. The food product manufacturing sector's GDP grew 10.2% from 1997 to 1999 but then dropped 6.4% from 1999 to 2001 (Figure 10). From 2001, the sector increased by 39.8% to \$3.8B in 2004. After two years of decline in 2005 and 2006, the sector increased 8.7% to \$3.6B, close to the high in 2004. Some of the growth in the industry is explained

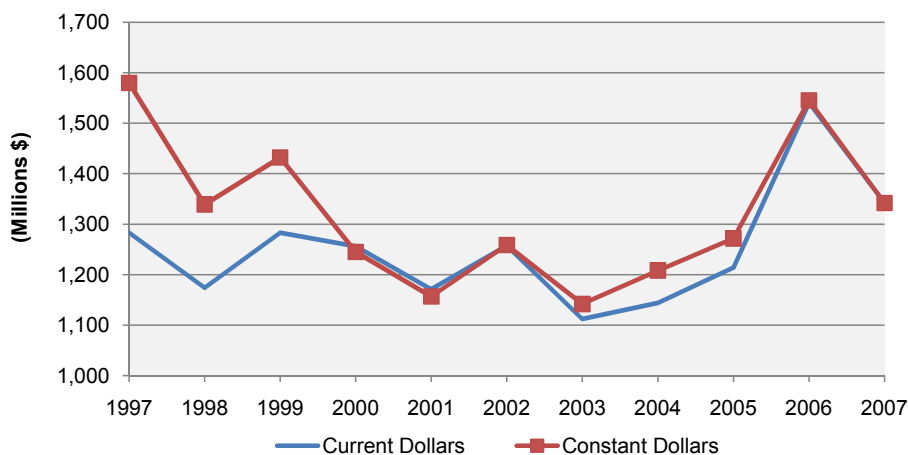
Figure 10. The GDP of Food Product Manufacturing, 1997 - 2007<sup>a</sup>



Source: USDC, BEA (2009b)  
<sup>a</sup> Current and constant 2007 dollars

by the record high levels of production agriculture, the resolution of many trade issues between Russia and Mexico, and a general increase in foreign demand for agricultural products.

Figure 11. The GDP of Paper Manufacturing, 1997 - 2007<sup>a</sup>

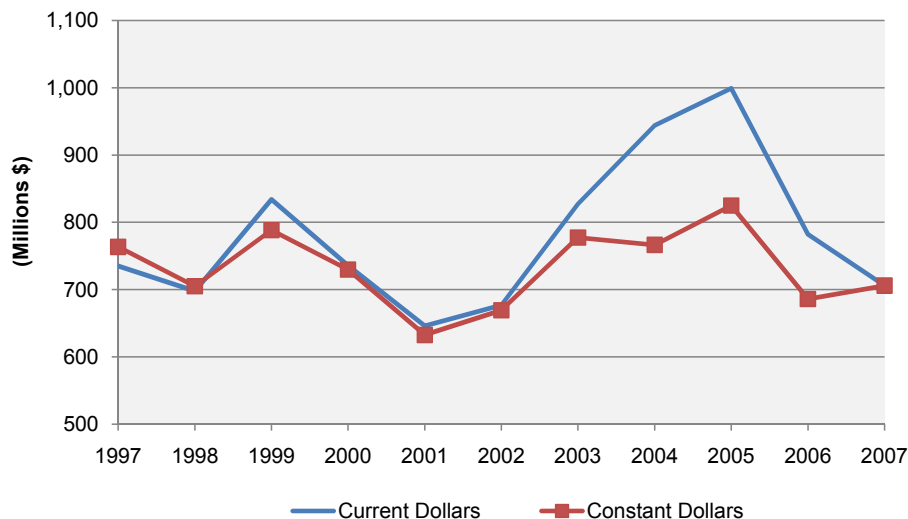


Source: USDC, BEA (2009b)  
<sup>a</sup> Current and constant 2007 dollars

**Paper Manufacturing**

The paper manufacturing sector is consistently one of the three largest processing industries in Arkansas. In 1997, its GDP was \$1.6B (Figure 11). However, pulp and paper manufacturers in North America were strongly affected by the Asian financial crisis during the mid-to-late 1990s (Simard, 1999), which continued to impact manufacturers through 2001. Figure 11 shows a substantial decline (15.2%) in the industry's value from 1997 to 1998 with a rebound of 6.9% the following year. From 1999 to 2001 the constant value of paper and allied products fell an additional 19.2%. This sector experienced strong growth from 2003 to 2006 as the GDP of paper manufacturing improved by 35.3%; however, it declined 13.2% in 2007 down to \$1.3B.

Figure 12. The GDP of Wood Product Manufacturing, 1997 - 2007<sup>a</sup>



Source: USDC, BEA (2009b)  
<sup>a</sup> Current and constant 2007 dollars

**Wood Product Manufacturing**

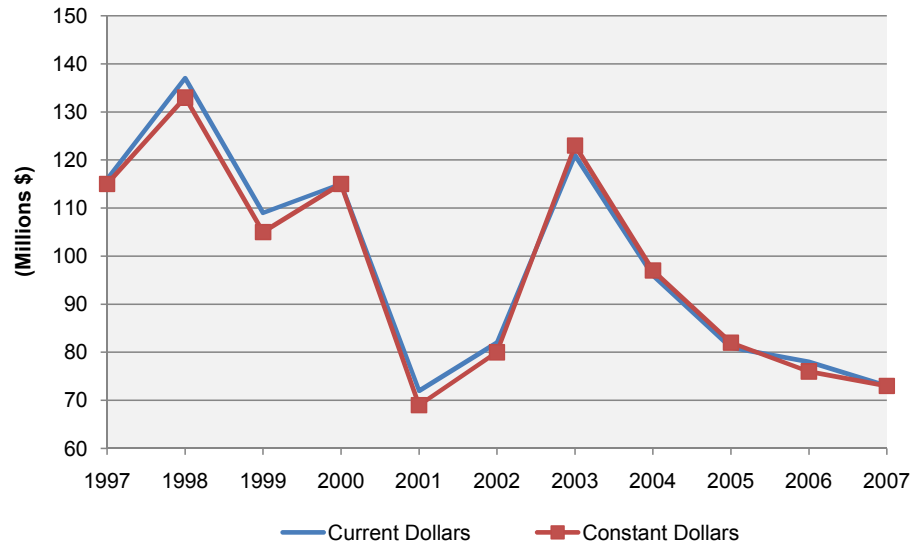
After a brief increase from 1998 to 1999, the GDP of wood product manufacturing plummeted 19.8% from 1999 to 2001 (Figure 12). As explained in detail in Popp et al. (2005), most of the decline in this industry was attributed to a slow-down in the international market for US wood chips and a drop in soft wood prices that followed an influx of Canadian wood on the market. This

sector experienced steady growth from 2001 to 2005, the only exception being a slight decrease in 2004, as the GDP for wood product manufacturing increased by 23.3% to \$825M. Economic activity in the U.S. was strong in 2005 and during the first half of 2006; however, new housing construction weakened during the second half of 2006 (USDA Forest Service, 2009). New construction accounts for more than one third of the U.S. annual consumption of sawn wood and structural panels, as well as other soft- and hardwood products. As a result, the sector's value dropped 16.8% in 2006 and rebounded only slightly in 2007, up 2.9% to \$706M.

**Furniture and Related Products Manufacturing**

During the period in which most agricultural processing sectors experienced a decline in GDP, the furniture and related products manufacturing sector actually increased 11.2% between 1997 and 1998 (Figure 13). 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); however, as housing activity slowed in the late 1990s, lumber and furniture GDP also fell, as witnessed in a nearly 20% decline from 1998 to 2001. The housing and real estate markets were gaining momentum in 2002, represented by the sharp increase in this sector for

**Figure 14. The GDP of Textile and Textile Product Mills, 1997 - 2007<sup>a</sup>**



Source: USDC, BEA (2009b)  
<sup>a</sup> Current and constant 2007 dollars

that year; however, imports of furniture and other wood producers were also on the rise, flooding the market with less expensive substitutes for US manufactured products. This in part led to the decline from 2002 to 2005, a drop of 28.1%. The GDP of furniture and related products manufacturing recovered slightly in 2006 before declining again in 2007 to \$351M.

**Textile and Textile Product Mills**

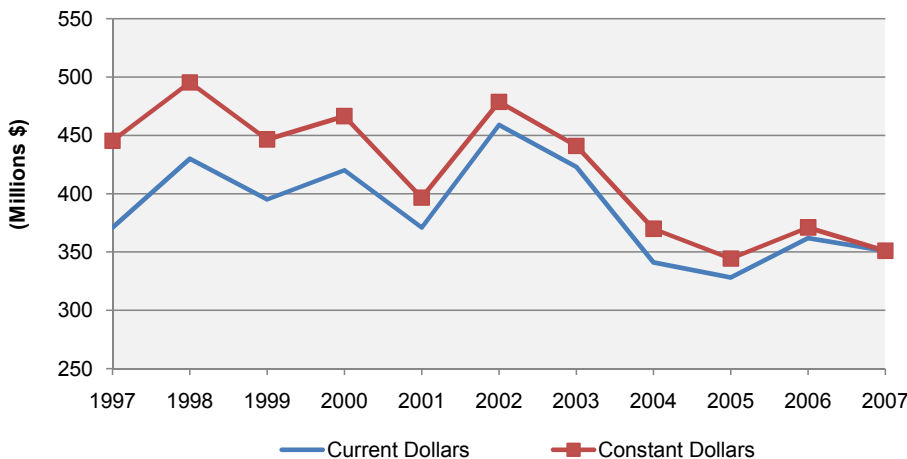
The textile and textile product mills sector has been in decline for three decades. Technological improvements and import competition have reduced the industry in the U.S. The decline in

textile and apparel industries accelerated following the implementation of the North American Free Trade Agreement (NAFTA) with Canada and Mexico in 1994. In late summer 2000, U.S. manufacturing went into a downturn and, in March 2001, the economy slipped into recession (USDA, ERS, 2008d). From 1998 to 2001, the textile sector declined in value by almost half (48.1%) (Figure 14); much of the steep decline in 2001 occurred because a major textile manufacturer closed its last plant in Arkansas in 2000. In 2002 and 2003, the industry experienced a dramatic increase of 78.3% before declining each year since 2003. Although 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 might explain some of the growth in 2002 and 2003 (USCC, 2002; USDA FAS, 2001; Wall, 2000).

**Apparel, Leather and Allied Products Manufacturing**

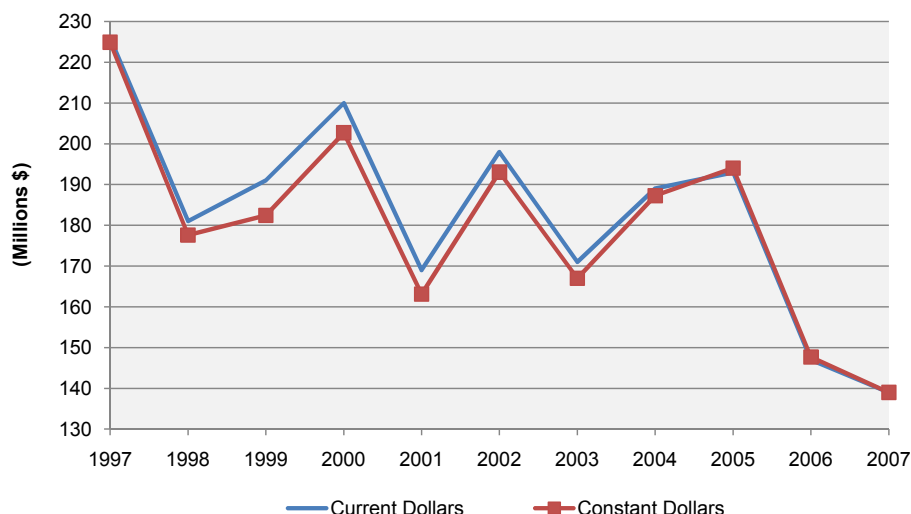
As seen in Figure 15, the GDP for apparel, leather and allied products manufacturing has experienced alternating periods of growth and decline. Overall, from 1997 to 2007, the sector has declined from a high of \$225M to a low of \$139M in 2007, representing a drop of 38.2% over the 11-year period. Much like the textile industry,

**Figure 13. The GDP of Furniture and Related Products Manufacturing, 1997 - 2007<sup>a</sup>**



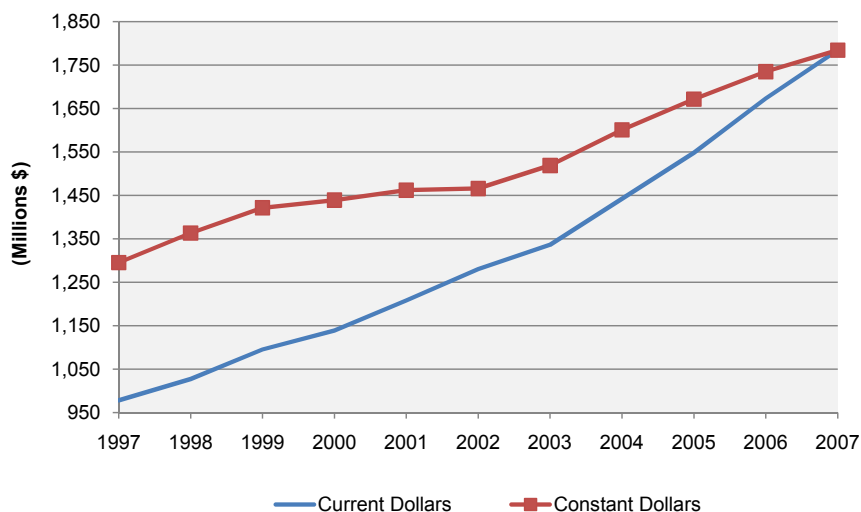
Source: USDC, BEA (2009b)  
<sup>a</sup> Current and constant 2007 dollars

Figure 15. The GDP of Apparel, Leather and Allied Products Manufacturing, 1997 - 2007<sup>a</sup>



Source: USDC, BEA (2009b)  
<sup>a</sup> Current and constant 2007 dollars

Figure 16. The GDP of Food Services and Drinking Places, 1997 - 2007<sup>a</sup>



Source: USDC, BEA (2009b)  
<sup>a</sup> Current and constant 2007 dollars

apparel manufacturing has been in decline in the U.S. for over thirty years. The decline has been partly blamed on NAFTA which possibly accelerated the drop in apparel manufacturing in the late 1990's. Although there have been periods of growth in the sector, the GDP for apparel, leather and allied products manufacturing has decreased 28.4% since 2005.

### Food Services and Drinking Places

The food services and drinking places sector has increased every year from 1997 to 2007 (Figure 16). The overall growth over that time period for

the sector was 37.8% to a high of \$1.8B in 2007; the average annual growth rate for the sector has been 3.4%. Foodservice operators, including restaurants and fast food outlets, have increased their share of total food spending over the years (USDA, ERS, 2008c). 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. By 2006, food-away-from-home spending by households and businesses accounted for nearly 50 percent of all food spending, up from 45 percent in 1990 and 39 percent in 1980.

## Summary of the Trends in Gross State Product for Agriculture and Food

Goodwin et al. (2002) showed the Agriculture and Food Sector to be a very strong part of the Arkansas economy. Popp et al. (2005) found that between 1999 and 2001, Agriculture and Food had lost share and value in nearly all of its production and processing areas, mainly due to depressed prices and lost market share. Popp et al. (2007) concluded that more recent data suggested that between 2001 and 2004, much of the Agriculture and Food Sector has rebounded. While cash receipts records for Arkansas commodities were set in 2006 then again in 2007, on-farm expenses have also been on the rise. Crop production values have also risen since 2005 due to a strong foreign demand and from the domestic biofuels industry. These increased prices have been sufficient to outpace increasing expenses, for the most part. Conversely, in the Animal Agriculture Sector, cash receipts rose in 2007 but the increased costs of production offset most of the gains in income. Most agricultural manufacturing sectors declined in 2007, with the exception the food manufacturing sector which benefited from the record high levels of production. The overall decline in manufacturing becomes more evident later in this document through the in-depth contribution analysis, which examines the effects of lower input purchases and decreased spending by employees in these manufacturing industries. Finally, the Agricultural Retail Sector has continued to grow, as it has done for the past eleven years. If food service operators continue to increase their share of total food spending by consumer, the upward trend in this industry could continue.

# Direct, Indirect, and Induced Contributions of Agriculture

The total economic contribution of Arkansas' Agricultural Sector is much more than the direct contribution of agricultural production and processing. To measure agriculture's total economic contribution, the indirect and induced contributions of agriculture must also be taken into consideration. Indirect contributions occur when the Agricultural Sector purchases goods and services from local businesses. The production of fertilizers and certain farm machinery and equipment, for example, are indirect contributions of agricultural production. Agriculture's induced contributions are measured by increases in economic activity to satisfy the personal consumption by employees of the Agricultural Sector and by employees of firms that provide inputs to the Agricultural Sector. The sum of direct, indirect, and induced agricultural effects provides a measure for the total economic contribution of agriculture.

## Methods

As in Popp et al. (2007), the economic contributions of Arkansas' Agricultural Sector were modeled using the Impact Analysis for Planning (or IMPLAN) System (MIG, 2009), input-output (I-O) modeling software. Contributions are reported in terms of employment, labor income, and value added (these measures are described below). The only sectors included as part of the Agriculture Sector in the analysis are those with economic activities considered to be 100% tied to agriculture (such as rice farming or poultry processing). Any sector not 100% tied to agriculture is not included as part of the direct Agriculture Sector (such as restaurants, grocery stores, fertilizer manufacturers and distributors). However, the indirect and induced contributions of these non-agricultural sectors are still included in the total contribution of agriculture.

### Measures of Economic Contribution

Total economic contributions are made up of three separate components: 1) direct contributions - generated by farm production and processing of crops, poultry, livestock and forest products; 2) indirect contributions - generated when agricultural firms purchase materials and services from other Arkansas

businesses; and 3) induced contributions - result from employees of agricultural firms and their suppliers spend a portion of their income within Arkansas. Each of these contributions makes up an important part of the total economic contribution of the Arkansas Agriculture Sector. The overall definition of the Agriculture Sector in this study is limited to only those sectors considered to be 100 percent tied to agriculture. However, the indirect and induced contributions measure the contributions of those industries that are linked to agriculture but may not be entirely defined as agriculture. These industries represent important economic bases of many communities across the state and contribute to the jobs, income and value added in these communities due to their relationships with agriculture. Since sectors are inter-linked throughout the state, expansions in activities in one sector can cause other activities, in other sectors, to expand. Therefore, the contributions accruing in other sectors are added as well.

Economic contributions are often measured in terms of: 1) total industry output, 2) labor income (wages, salaries, rents and profits) and wages, 3) total value added, and 4) employment. I-O analysis can be used to assess the economic contribution of an existing sector. These measures are thought of as a sector's gross contribution to the

regional economy. This is accomplished by "removing" the sector of choice from the I-O model and examining how this removal impacts the economic activity in the region. This provides an estimate of the contribution of the sector by looking at the losses experienced (or activity generated) by the sector of interest.

Employment includes all wage and salary employees, as well as self-employed jobs in a given sector. All jobs are not equal; they pay different wages, require different skills and different work hours, etc., which makes aggregate estimates or comparisons across regions and industries problematic tricky. However, jobs are a measure of economic contribution easily understood and contributions are often reported in terms of jobs. Labor income consists of two parts: first is proprietary income, which includes all income received by self-employed individuals including private business owners, doctors, lawyers, etc; second is wages, which includes all worker salaries, payments, and fringe benefits paid by employers. Value added represents all payments to workers (labor income) plus indirect taxes and other property-type income, such as payments for rents, royalties, and dividends. Value added is comparable to GDP by State but is measured using different data sources and methodologies, so the data are not equal. Value added is the income and

indirect business taxes generated by the activity and offers a more complete examination of the total economic contribution of an activity on a region; therefore, economists generally prefer value-added as the measure for assessing the contribution of a given industry or activity to a region's economy (Olson and Lindall, 2009). Income and value-added are also relatively clear measures of economic contribution that can be directly compared across industries and regions that contain a range of different economic activities.

Measuring the economic importance of an industry using output can be misleading. Output represents the dollar value of an industry's total production, but can also be thought of as the sum of the goods and services used to provide a product. Economic contribution analyses estimate the contribution of production (output) by including purchases from other industries to produce the inputs required to create this output; therefore, output includes the production of intermediate goods which are included in another industry's output. Summing the output of all industries would include multiple counting of some goods and services. Gross sales receipts overestimate the economic size of an industry because the values of inputs are recounted at each succeeding stage of production. As a result, output should not be used as a measure of economic contribution, and therefore is not reported here.

## **General Procedures**

There are several key considerations in the construction of the IMPLAN I-O models used to measure the economic contribution of the Agriculture Sector. For each step of the analysis, careful consideration was taken to ensure that the analysis reflects accurately the Arkansas Agriculture Sector. The main steps for constructing the models were: data reconciliation, selection of multipliers, estimating trade flows, the transaction basis, and local purchase coefficients.

The Agriculture Sector is made up of three broad categories of agricultural industries: agricultural production

industries, agricultural processing industries, and agricultural related industries. The output data for the agricultural production industries (IMPLAN sectors 1-14) were checked for accuracy against the latest available estimates for the value of production from the USDA National Agricultural Statistics Service (NASS) and Economic Research Service (ERS). The agricultural production data in IMPLAN are sometimes unreliable for three reasons. First, output data for all industries outside of agriculture are estimated from a large number of sources, but data for agricultural production are derived entirely from NASS value of production data and the most recent U.S. Census of Agriculture. Due to NASS publication lags, IMPLAN data are often released using preliminary estimates for a given year. To check the accuracy of the IMPLAN data, the Agricultural production industries are compared against finalized NASS/ERS data for the relevant year. Second, there are also non-disclosure problems, particularly at the county level; this makes data reconciliation between IMPLAN and NASS data difficult at the county level. Third, employment and income data for the agriculture sectors are difficult to estimate since there are no employment and earnings data collected on a commodity basis. The only farm employment and income data are derived from BEA's Regional Economic Information System (REIS) program but these are only single farm employment and income numbers for all agriculture sectors combined. The Minnesota IMPLAN Group, Inc. (MIG) collects estimates of output and creates vectors of employment and income to allocate the single REIS value to the separate IMPLAN agriculture production sectors (Lindall, 1998). MIG encourages analysts with better agriculture data to use it when building models (Olson and Lindall, 2009, p. 237).

The default IMPLAN data were updated with the most recent NASS/ERS output estimates for the state of Arkansas. In any industry where a data discrepancy exists, the default output data was changed to reflect the NASS/ERS output estimate. For any sector where a change was made to the value of output, a change corresponding to the percent

change in output was also made to all four components of value added. This holds the relationship between Total Industry Output and Total Value Added (a fundamental relationship in I-O analysis) constant, and the model production functions are left unchanged. Once the default IMPLAN data has been updated to reflect the most recent NASS/ERS estimates, the type of multiplier used to construct the model is selected.

Multipliers describe the response of the economy to a change in economic activity and estimate changes in output, employment, income and value added. When analyzing the economic contributions of the Agriculture Sector, type SAM (Social Accounting Matrix) multipliers are used to incorporate household expenditures into the models and to calculate the indirect and induced contributions. Type SAM multipliers are the direct, indirect and induced effects where the induced effect is based on both study area data and additional information in the social account matrix. The SAM framework tracks both market and non-market flows. The non-market flows are transactions between non-industrial institutions such as households to government, government to households, and so on. These flows are called "inter-institutional transfers" (Alward and Lindall, 1996). The SAM multiplier approach enables the model to account for commuting, social security tax payments, household income tax payments, and savings; it accounts for income that is not normally re-spent immediately within the region, such as commuting workers who live outside the region and retirement benefits. I-O models built with Type SAM multipliers would have results that are lower than an I-O model built with Type II multipliers (also available in IMPLAN). The Type SAM is the most appropriate choice for analyzing the contributions of the Agriculture Sector.

Estimating trade flows across regional boundaries is possibly the largest source of error in non-survey I-O models (Stevens and Trainor, 1980) and the selection and use of the RPC is one way to eliminate some of the errors. The RPC represents the proportion of intermediate demands and local demands

for a specific commodity that will be satisfied by local production (Olson and Lindall, 2009). For example, a RPC value of 0.80 means that 80% of the final demand for the industry is provided by local producers. The remainder (20%) is the portion imported from outside the region. To avoid overestimation of the Agriculture Sector, the model RPCs must be set to zero for these industries, in other words, the model is instructed to not buy products and services of the Agriculture Sector locally, thereby removing it from the production function and not allowing these sectors to capture any indirect and induced effects. This will force the model to truly measure the indirect and induced contribution of Agriculture Sector output.

When conducting impact analysis, IMPLAN allows the user to determine the transaction basis (industry or commodity) for the change in final demand. The industry basis assumes that the sector is solely responsible for the entire value of the product or service being sold (such as the oilseed farming industry is solely responsible for the entire value of soybeans produced). The commodity basis will allocate spending to all industry sectors that produce the goods and services purchased according to their market shares (such as retail purchases of groceries). Each industry included in the Agriculture Sector is the solely responsible for the entire value of the product or service in their respective industry; thus the industry basis is selected when running the impact analysis.

The final important procedure is to estimate the portion of activity that accrues to the local (in this case the state) economy. This was previously termed in IMPLAN as the Local Purchase Coefficient (LPC) but is now known as %Local. Only the portion of an industry's value that is produced locally should accrue to the local economy. For instance, output in the oilseed farming industry (IMPLAN sector 1) involves the %Local being set at 100%, which means the entire output value of the industry accrued to the region, because the goods in

the sector are produced within the study region. Alternately, spending by tourists on gasoline and oil would involve the %Local being set to the RPC generated value so that only the portion produced locally (hence the RPC) accrues to the local economy. Estimating the economic contribution of the Agriculture Sector involves applying 100% of each industry considered part of the Agriculture Sector to the local economy.

## Important Changes

There are two key differences between the 2007 IMPLAN model and previous releases. First, the sectoring scheme was changed to conform to the 2007 NAICS. As a result, the IMPLAN model number of sectors went from 509 to 440 sectors. Second, the 2007 model was the first to incorporate the 2002 BEA I-O benchmark tables. As a result of the sectoring changes just mentioned, some sectors previously defined as agriculture were combined or aggregated into larger sectors; additionally, some new sectors were created. Overall, the number of agriculture sectors in the Arkansas Agriculture Sector model decreased from 114 to 96; however, with the new data, some economic activities from sectors not included in the 2003 and 2006 data year studies were included. A small number of low output sectors in Arkansas were also included to bring our sectoring scheme in line with the BEA definitions (also NAICS based) in the GDP by State data set for 1) Agriculture, Forestry, Fishing, and Hunting, 2) Wood Product Manufacturing, 3) Furniture and Related Products Manufacturing, 4) Food Manufacturing, 5) Textile and Textile Product Mills, 6) Apparel, Leather and Allied Products Manufacturing, and 7) Paper Manufacturing. The IMPLAN sectors used to create those categories are presented in Appendix B, Tables 1 - 3.

In 2007, the Bureau of Economic Analysis (BEA) released its benchmark input-output (I-O) accounts for 2002. These accounts provide a comprehen-

sive picture of the inner workings of the economy, showing relationships among more than 400 industries and commodities. The benchmark I-O tables are only produced every 5 years. The new I-O tables combined with the new IMPLAN sectoring prompted a revision to the 2006 estimates using the newly released IMPLAN model. All study area data from the 2006 models were exported to and manipulated in Microsoft Access to conform to the 2007 model format. All 2006 data for output, income and value added were converted to 2007 dollars then the updated 2006 data were used to build a revised 2006 IMPLAN model using the 2007 IMPLAN software. Some of the 2006 revised estimates will be presented in this report and the full results are listed in Appendix C.

The results of the economic contributions of agriculture were grouped into four main categories: Crops Sector, Animal Agriculture Sector, Forestry Sector, and Aggregate Agriculture. For the first three sub categories, agriculture is defined as those production and processing sectors in IMPLAN directly related to that category (Crops, Animal, or Forestry). The IMPLAN sectors used to create those categories are presented in Appendix B, Tables 1 to 3. Aggregate Agriculture is defined as the Crops, Animal Agriculture, and Forestry Sectors plus other Agriculture-Related Sectors (presented in Appendix B, Table 4). Aggregate Agriculture was created using all of the sectors listed in Appendix B, Tables 1 through 4. In some cases, results are presented as production and processing contributions. The sectors that contributed to these contributions are listed in Appendix B, Tables 5 and 6. State level IMPLAN data for Arkansas for 2006 and 2007 (the most recent data available) were used to calculate all contributions (MIG, 2008; 2009). The relevant employment, labor income, and value added contributions of agriculture are detailed in Appendix C and are summarized below. All labor income and value added figures are reported in 2007 dollars, unless otherwise noted.

## The Aggregate Agricultural Sector

In 2007, agriculture made large contributions to the economy in terms of employment, labor income, wages, and value added (see Box 1). The Aggregate Agricultural Sector provided 268,617 jobs, or 17.0%, of state employment (Table 2a). That is, one in six Arkansas jobs can be attributed to agriculture. In that same year, agriculture paid \$9.2B, or 15.4% of state labor income. Wages

accounted for \$7.5B, or 82.3% of total labor income generated by agriculture. Additionally, the Aggregate Agricultural Sector added \$15.2B of value to the state economy, or 16.3% of state value added. That is, more than \$1 out of every \$6 in value added can be attributed to agriculture. Details of these contributions are presented in Appendix C, Table 1a and are summarized in Tables 2a through 4a below.

Agriculture generates employment in all 20 of the 2-digit NAICS aggregated industries (or sectors). Three-quarters, or almost 75%, of all agriculture-generated jobs are in five industries (Box 2). The Poultry Sector (comprised of *Poultry Processing* and *Poultry and Eggs*) alone provides 40,707 jobs or just over 25% of all agricultural generated jobs in Arkansas. *Poultry Processing* employed 30,226 of these workers. The remaining 10,481 workers are employed in *Poultry and Egg Production*.

The far-reaching contributions of agriculture are seen in the distribution of agriculture-generated value added throughout the economy. Box 3 shows the five industries that benefit most from value added generated by agriculture. Note that three of those industries (Real

### Box 1. Total Contribution to Arkansas Agriculture, 2007<sup>a</sup>

<b>Employment</b>
268,617 jobs (over 1 out of 6 Arkansas jobs)
<b>Wages</b>
\$7.54B (17% of Arkansas wages)
<b>Labor Income</b>
\$9.16B (15% of Arkansas labor income)
<b>Value-Added</b>
\$15.19B (over \$1 of every \$6 of added value)

<sup>a</sup>Current dollars

### Box 2. Employment Generated by Agriculture, 2007 Top Five NAICS Industries<sup>a</sup>

<b>Manufacturing</b>
86,577 jobs (96% of the jobs are in agricultural processing)
<b>Agriculture, Forestry, Fishing and Hunting</b>
78,449 jobs (86% of the jobs are in agricultural production)
<b>Retail Trade</b>
12,806 jobs
<b>Health and Social Services</b>
11,951 jobs
<b>Transportation and Warehousing</b>
10,206 jobs
<b>Top Five Total</b>
199,989 jobs (74% of all jobs generated by Agriculture)

<sup>a</sup>Based on 2-Digit NAICS aggregation (USCB, 2006)

Table 2a. The Aggregate Agriculture Sector's Contribution to Arkansas' Economy, 2007

	<u>Employment</u> <sup>a</sup>			<u>Labor Income</u> <sup>b</sup>			<u>Value-Added</u> <sup>c</sup>		
	Number of Jobs	% Total Contribution	% Total Arkansas Jobs	Million \$ <sup>d</sup>	% Total Contribution	% Total Arkansas Labor Income	Million \$	% Total Contribution	% Total Arkansas Value Added
Production <sup>e</sup>	67,491	25.1	4.3	1,374	15.0	2.3	3,342	22.0	3.6
Processing <sup>f</sup>	82,691	30.8	5.2	3,496	38.2	5.9	4,597	30.3	4.9
Ag-Related <sup>g</sup>	10,958	4.1	0.7	296	3.2	0.5	268	1.8	0.3
<b>Direct Contribution</b>	<b>161,140</b>	<b>60.0</b>	<b>10.2</b>	<b>5,166</b>	<b>56.4</b>	<b>8.7</b>	<b>8,208</b>	<b>54.0</b>	<b>8.8</b>
Indirect Effects	54,553	20.3	3.5	2,403	26.2	4.0	4,097	27.0	4.4
<b>Direct + Indirect Contribution</b>	<b>215,694</b>	<b>80.3</b>	<b>13.7</b>	<b>7,569</b>	<b>82.7</b>	<b>12.7</b>	<b>12,304</b>	<b>81.0</b>	<b>13.2</b>
Induced Effects	52,923	19.7	3.4	1,588	17.3	2.7	2,881	19.0	3.1
<b>Total Contribution</b>	<b>268,617</b>	<b>100.0</b>	<b>17.0</b>	<b>9,157</b>	<b>100.0</b>	<b>15.4</b>	<b>15,186</b>	<b>100.0</b>	<b>16.3</b>

Source: Computed using the 2007 Arkansas database from MIG (2009)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)

<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)

<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

<sup>d</sup> Current dollars

<sup>e</sup> Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors

<sup>f</sup> Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors

<sup>g</sup> Ag-related sectors include agricultural sectors not categorized as agricultural production or processing. These sectors are: Fishing, Hunting and Trapping, Agriculture and Forestry Support Activities, and New Farm Housing Units and Additions and Alterations

**Box 3. Value Added Generated by Agriculture, 2007<sup>a</sup> Top Five NAICS Industries<sup>b</sup>**

<b>Manufacturing</b>
\$4.95B
(93% of the value added is in agricultural processing)
<b>Agriculture, Forestry, Fishing and Hunting</b>
\$3.61B
(93% of the value added is in agricultural production)
<b>Real Estate and Rental</b>
\$1.01B
<b>Wholesale Trade</b>
\$991.62M
<b>Transportation and Warehousing</b>
\$679.30M
<b>Top Five Total</b>
\$11.24B
(74% of all value added generated by Agriculture)

<sup>a</sup>Current dollars<sup>b</sup>Based on 2-Digit NAICS aggregation (USCB, 2006)**Box 4. Labor Income Generated by Agriculture, 2007<sup>a</sup> Top Five NAICS Industries<sup>b</sup>**

<b>Manufacturing</b>
\$3.70B
(94% of labor income is in agricultural processing)
<b>Agriculture, Forestry, Fishing and Hunting</b>
\$1.67B
(82% of labor income is in agricultural production)
<b>Wholesale Trade</b>
\$585.60M
<b>Transportation and Warehousing</b>
\$471.93M
<b>Health and Social Services</b>
\$470.04M
<b>Top Five Total</b>
\$6.90B
(75% of all labor income generated by Agriculture)

<sup>a</sup>Current dollars<sup>b</sup>Based on 2-Digit NAICS aggregation (USCB, 2006)

in Forestry.

As with value added, much of the income attributable to agricultural activity is generated outside of agricultural sectors. Box 4 shows the five industries that benefit most from income generated by agriculture. In 2007, \$4.3B, or 46.8% of all labor income, went to workers in non-agricultural sectors. Within the agricultural sectors, *Poultry Processing, Grain Farming, Poultry and Egg Production, Support Activities for Agriculture and Forestry, and Paper*

Estate and Rental, Wholesale Trade, and Transportation and Warehousing) reside outside of the Agriculture Sector as defined here. While almost half (48%) of all agriculture-generated value added accrues outside agricultural Sectors, these industries are closely tied to agriculture. For instance, the Wholesale Trade industry contains businesses such as grain and

livestock wholesalers as well as farm supply wholesalers. Within the Agriculture Sector, *Poultry Processing, Grain Farming, Poultry and Egg Production, Logging, and Oilseed Farming* add the largest amount of value in the economy. About 19% (\$2.8B) of value added by Agriculture accrues in Crops, 15% (\$2.3B) in Animal Agriculture, and 19% (\$2.8B)

*Mills* received \$2.2B, or 24.4% of all labor income generated.

Agriculture's direct contribution on the state economy is measured by the sum of the contributions of farm production, the processing of farm products and agriculture related sectors. There were 161,140 workers employed by the agricultural production, processing and

**Table 2b. The Aggregate Agriculture Sector's Contribution to Arkansas' Economy, 2006 Revised**

	<u>Employment<sup>a</sup></u>			<u>Labor Income<sup>b</sup></u>			<u>Value-Added<sup>c</sup></u>		
	Number of Jobs	% Total Contribution	% Total Arkansas Jobs	Million \$ <sup>d</sup>	% Total Contribution	% Total Arkansas Labor Income	Million \$	% Total Contribution	% Total Arkansas Value Added
Production <sup>e</sup>	63,077	23.3	4.0	1,140	12.4	2.0	2,908	18.2	3.2
Processing <sup>f</sup>	88,486	32.7	5.7	3,743	40.8	6.6	5,726	35.9	6.4
Ag-Related <sup>g</sup>	11,143	4.1	0.7	291	3.2	0.5	261	1.6	0.3
<b>Direct Contribution</b>	<b>162,706</b>	<b>60.1</b>	<b>10.4</b>	<b>5,173</b>	<b>56.3</b>	<b>9.1</b>	<b>8,895</b>	<b>55.7</b>	<b>9.9</b>
Indirect Effects	54,663	20.2	3.5	2,421	26.4	4.3	4,011	25.1	4.5
<b>Direct + Indirect Contribution</b>	<b>217,369</b>	<b>80.3</b>	<b>13.9</b>	<b>7,594</b>	<b>82.7</b>	<b>13.3</b>	<b>12,906</b>	<b>80.8</b>	<b>14.4</b>
Induced Effects	53,374	19.7	3.4	1,587	17.3	2.8	3,064	19.2	3.4
<b>Total Contribution</b>	<b>270,744</b>	<b>100.0</b>	<b>17.4</b>	<b>9,181</b>	<b>100.0</b>	<b>16.1</b>	<b>15,971</b>	<b>100.0</b>	<b>17.8</b>

Source: Computed using the 2006 Arkansas database from MIG (2008)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes<sup>d</sup> Current dollars<sup>e</sup> Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors<sup>f</sup> Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors<sup>g</sup> Ag-related sectors include agricultural sectors not categorized as agricultural production or processing. These sectors are: Fishing, Hunting and Trapping, Agriculture and Forestry Support Activities, and New Farm Housing Units and Additions and Alterations



agriculture related sectors. The crops industries employed more than one out of every three (39.5%) of these workers (Tables 3a and 4a), while the animal agriculture industries employed 38.4% and the forestry industries 22.1%. The owners, operators and workers of these farms and businesses received nearly \$5.2B in labor income. 71.8% of the labor income went to workers and business owners in processing industries. Crops, Animal Agriculture, and Forestry Sectors directly added value of \$8.2B to the Arkansas economy, nearly sixty percent of which came from processing industries.

Indirect contributions result when

agricultural firms purchase raw materials and services from other Arkansas businesses to produce their products. In 2007, there were 54,553 workers employed by industries supplying goods and services to the farm production and processing industries. These workers and the owners of those establishments received \$2.4B in labor income and these industries added value of over \$4B to the state economy.

Induced contributions result when employees of agricultural firms and employees of the raw material and service firms spend a portion of their income on local purchases. There were

52,923 workers employed by businesses providing goods and services to the employees in agriculture and its supplying industries. These employees and the proprietors of these businesses received over \$1.6B in labor income and added value of roughly \$2.9B to the Arkansas economy.

The revised estimates for 2006 showed that the Aggregate Agricultural Sector provided 270,744 jobs (17.4% of state employment), paid \$9.2B in labor income (16.1% of state labor income), paid wages of \$7.9B and generated \$16.0B of value added to the state economy (17.8% of state value added)

**Table 3a. The Contribution of Major Agricultural Sectors to Agricultural Production, 2007**

	<u>Employment</u> <sup>a</sup>		<u>Labor Income</u> <sup>b</sup>		<u>Value-Added</u> <sup>c</sup>	
	(Number of Jobs)	(% Ag. Prod.)	(Million \$) <sup>d</sup>	(% Ag. Prod.)	(Million \$)	(% Ag. Prod.)
Crops	40,615	60.2	799	58.2	1,609	48.2
Animal Agriculture	20,716	30.7	351	25.5	888	26.6
Forestry	6,161	9.1	224	16.3	844	25.3
<b>Total</b>	<b>67,491</b>	<b>100.0</b>	<b>1,374</b>	<b>100.0</b>	<b>3,342</b>	<b>100.0</b>

Source: Computed using the 2007 Arkansas database from MIG (2009)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)

<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)

<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

<sup>d</sup> Current dollars

**Table 3b. The Contribution of Major Agricultural Sectors to Agricultural Production, 2006 Revised**

	<u>Employment</u> <sup>a</sup>		<u>Labor Income</u> <sup>b</sup>		<u>Value-Added</u> <sup>c</sup>	
	(Number of Jobs)	(% Ag. Prod.)	(Million \$) <sup>d</sup>	(% Ag. Prod.)	(Million \$)	(% Ag. Prod.)
Crops	32,043	50.8	519	45.6	1,332	45.8
Animal Agriculture	25,334	40.2	415	36.4	1,218	41.9
Forestry	5,699	9.0	205	18.0	359	12.3
<b>Total</b>	<b>63,077</b>	<b>100.0</b>	<b>1,140</b>	<b>100.0</b>	<b>2,908</b>	<b>100.0</b>

Source: Computed using the 2006 Arkansas database from MIG (2008)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)

<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)

<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

<sup>d</sup> Current dollars

**Table 4a. The Contribution of Major Agricultural Sectors to Agricultural Processing, 2007**

	<u>Employment</u> <sup>a</sup>		<u>Labor Income</u> <sup>b</sup>		<u>Value-Added</u> <sup>c</sup>	
	(Number of Jobs)	(% Ag. Proc.)	(Million \$) <sup>d</sup>	(% Ag. Proc.)	(Million \$)	(% Ag. Proc.)
Crops	18,699	22.6	849	24.3	1,225	26.6
Animal Agriculture	36,894	44.6	1,269	36.3	1,389	30.2
Forestry	27,098	32.8	1,378	39.4	1,984	43.1
<b>Total</b>	<b>82,691</b>	<b>100.0</b>	<b>3,496</b>	<b>100.0</b>	<b>4,597</b>	<b>100.0</b>

Source: Computed using the 2007 Arkansas database from MIG (2009)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)

<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)

<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

<sup>d</sup> Current dollars

**Table 4b. The Contribution of Major Agricultural Sectors to Agricultural Processing, 2006 Revised**

	<b>Employment<sup>a</sup></b>		<b>Labor Income<sup>b</sup></b>		<b>Value-Added<sup>c</sup></b>	
	(Number of Jobs)	(% Ag. Proc.)	(Million \$) <sup>d</sup>	(% Ag. Proc.)	(Million \$)	(% Ag. Proc.)
Crops	19,822	22.4	863	23.1	1,604	28.0
Animal Agriculture	38,876	43.9	1,317	35.2	1,494	26.1
Forestry	29,788	33.7	1,563	41.8	2,629	45.9
<b>Total</b>	<b>88,486</b>	<b>100.0</b>	<b>3,743</b>	<b>100.0</b>	<b>5,726</b>	<b>100.0</b>

Source: Computed using the 2006 Arkansas database from MIG (2008)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)

<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)

<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

<sup>d</sup> Current dollars

**Table 5a. The Crop Sector's Direct Contribution to Arkansas' Economy, 2007**

	<b>Employment<sup>a</sup></b>			<b>Labor Income<sup>b</sup></b>			<b>Value-Added<sup>c</sup></b>		
	Number of Jobs	% Total Contribution	% Total Arkansas Jobs	Million \$ <sup>d</sup>	% Total Contribution	% Total Arkansas Labor Income	Million \$	% Total Contribution	% Total Arkansas Value Added
Production <sup>e</sup>	40,615	68.5	2.6	799	48.5	1.3	1,609	56.8	1.7
Processing <sup>f</sup>	18,699	31.5	1.2	849	51.5	1.4	1,225	43.2	1.3
<b>Direct Contribution</b>	<b>59,314</b>	<b>100.0</b>	<b>3.8</b>	<b>1,649</b>	<b>100.0</b>	<b>2.8</b>	<b>2,835</b>	<b>100.0</b>	<b>3.0</b>

Source: Computed using the 2007 Arkansas database from MIG (2009)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)

<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)

<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

<sup>d</sup> Current dollars

<sup>e</sup> Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors

<sup>f</sup> Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors

(Table 2b). In 2006, direct contributions totaled 162,706 jobs, \$5.2B income \$8.9B valued added; indirect contributions of 54,663 jobs, \$2.4B in income, and \$4.0B in value added; and induced contributions of 53,374 jobs, \$1.6B in income, and \$3.1B in value added.

#### **Box 5. Direct Contribution to the Crops Sector, 2007<sup>a</sup>**

##### **Employment**

59,314 jobs

##### **Wages**

\$0.92B

##### **Labor Income**

\$1.65B

##### **Value-Added**

\$2.83B

<sup>a</sup>Current dollars

In 2006, the industries that make up the agricultural production sector contributed 63,077 jobs, \$1.1B in income and \$2.9B in value added (Table 3b). The agricultural processing sector contributed 88,486 jobs, \$3.7B in income, and \$5.7B in value added (Table 4b).

The Crops Sector (both production and processing) contributed 51,865 jobs, \$1.4B in income, and \$2.9B in value added. Animal Agriculture was responsible for 64,210 workers, \$1.7B in income and \$2.7B in value added. Finally, the Forestry Sector contributed 35,487 jobs, \$1.8B in income and almost \$3.0B in value added in 2006.

The revised 2006 estimates indicate that from 2006 to 2007, the total contributions of the Agriculture Sector

decreased by 2,126 jobs or 0.8%. Production agriculture increased by 4,415 jobs (7.0%) while agricultural processing decreased by 5,795 jobs (6.5%). Total income and value added were both lower in 2007 than in 2006, down \$24.0M and \$784.9M, respectively. Details on the Aggregate Agriculture Sector contributions can be found in Appendix C, Table 1b.

#### **Box 6. Top Crops Production Sectors Grain Farming, Oilseed Farming, and Cotton Farming**

63% of the jobs in the Crops Sector  
42% of the income in the Crops Sector  
51% of the value added in the Crops Sector

## The Crops Sector

The Crops Sector includes all enterprises engaged in the production and processing of cotton, food and feed grains, oil bearing crops, fruits, nuts and vegetables, and hay and pasture (Appendix B, Table 1). The Crops Sector's direct contribution on the state economy is measured by the sum of the contributions of crop production and processing of crops products.

In 2007, the Crops Sector provided 59,314 jobs within the Agriculture Sec-

tor, or 3.8% of state employment (Box 5, Table 5a). The workers and business owners received \$1.7B in labor income (\$920.1M of that in wages), or 2.8% of state labor income as presented in Table 5a. The Crops Sector added \$2.8B, or 3.0% of state value-added. *Grain Farming, Oilseed Farming and Cotton Farming* together represented 63% of jobs, 42% of labor income, and 51% of value added in the overall Crops Sector (Box 6). Details are provided in Table 5a

and Appendix C, Table 2a. The revised estimates for 2006 show that the direct contribution of the Crops Sector was 51,865 jobs (3.3% of state jobs), \$1.4B in income (2.4% of state income) and \$2.9B in value added (3.3% of state value added). Full details on the revised estimates for the Crops Sector for 2006 can be found in Table 5b and Appendix C, Table 2b.

**Table 5b. The Crop Sector's Direct Contribution to Arkansas' Economy, 2006 Revised**

	<u>Employment</u> <sup>a</sup>			<u>Labor Income</u> <sup>b</sup>			<u>Value-Added</u> <sup>c</sup>		
	Number of Jobs	% Total Contribution	% Total Arkansas Jobs	Million \$ <sup>d</sup>	% Total Contribution	% Total Arkansas Labor Income	Million \$	% Total Contribution	% Total Arkansas Value Added
Production <sup>e</sup>	32,043	61.8	2.1	519	37.6	0.9	1,332	45.4	1.5
Processing <sup>f</sup>	19,822	38.2	1.3	863	62.4	1.5	1,604	54.6	1.8
<b>Direct Contribution</b>	<b>51,865</b>	<b>100.0</b>	<b>3.3</b>	<b>1,382</b>	<b>100.0</b>	<b>2.4</b>	<b>2,935</b>	<b>100.0</b>	<b>3.3</b>

Source: Computed using the 2006 Arkansas database from MIG (2008)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)

<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)

<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

<sup>d</sup> Current dollars

<sup>e</sup> Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors

<sup>f</sup> Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors

**Table 6a. The Animal Agriculture Sector's Direct Contribution to Arkansas' Economy, 2007**

	<u>Employment</u> <sup>a</sup>			<u>Labor Income</u> <sup>b</sup>			<u>Value-Added</u> <sup>c</sup>		
	Number of Jobs	% Total Contribution	% Total Arkansas Jobs	Million \$ <sup>d</sup>	% Total Contribution	% Total Arkansas Labor Income	Million \$	% Total Contribution	% Total Arkansas Value Added
Production <sup>e</sup>	20,716	36.0	1.3	351	21.6	0.6	888	39.0	1.0
Processing <sup>f</sup>	36,894	64.0	2.3	1,269	78.4	2.1	1,389	61.0	1.5
<b>Direct Contribution</b>	<b>57,610</b>	<b>100.0</b>	<b>3.6</b>	<b>1,620</b>	<b>100.0</b>	<b>2.7</b>	<b>2,277</b>	<b>100.0</b>	<b>2.4</b>

Source: Computed using the 2007 Arkansas database from MIG (2009)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)

<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)

<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

<sup>d</sup> Current dollars

<sup>e</sup> Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors

<sup>f</sup> Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors

## The Animal Agriculture Sector

The Animal Agriculture Sector includes all enterprises engaged in the production and processing of animals, including poultry and egg, cattle, dairy farm, hogs and pigs, other animal agriculture, processed meat, and dairy processing industries (Appendix B, Table 2). The Animal Agriculture Sector's direct contribution on the state economy is measured by the sum of the contributions of animal production and processing of animal products. This sector accounted for 57,610 jobs in 2007,

or 3.6% of state employment, and these workers received \$1.6B in labor income, or 2.7% of state labor income. In 2007, the Animal Agriculture Sector added \$2.3B of value to the state economy, or 2.4% of state value-added (Table 6a and Box 7). Table 6a provides a summary of the Animal Agriculture Sector's total contribution on Arkansas' economy; details can be found in Appendix C, Table 3a. The *Poultry and Egg Production* and the *Poultry Processing* sectors provided 71% of jobs, 80% of income and 74% of

value added in the Animal Agriculture Sector in 2007 (Box 8). The revised estimates for 2006 indicated that the direct contributions of the Animal Agriculture Sector were 64,210 jobs (4.1% of state jobs), \$1.7B in labor income (3.0% state income), and \$2.7B in value added (3.0% of state value added) (Table 6b). Full details on the revised estimates for the Animal Agriculture Sector for 2006 can be found in Table 6b and Appendix C, Table 3b.

<b>Box 7. Direct Contribution to the Animal Agriculture Sector, 2007<sup>a</sup></b>	
<b>Employment</b>	57,610 jobs
<b>Wages</b>	\$1.43B
<b>Labor Income</b>	\$1.62B
<b>Value-Added</b>	\$2.28B

<sup>a</sup>Current dollars

<b>Box 8. The Poultry Industry (Poultry and Egg Production and Poultry Processing) Contributes<sup>a</sup>:</b>	
<b>Employment</b>	40,707 jobs (over 1 in 4 Agriculture jobs)
<b>Wages</b>	\$1.12B (28% of Agriculture wages)
<b>Labor Income</b>	\$1.29B (\$1 in \$4 of Agriculture labor income)
<b>Value-Added</b>	\$1.69B (\$1 in \$5 of Agriculture value added) 71% of Animal Agriculture Jobs, 78% of Wages, 80% of Income and 74% of Value Added are in the Poultry Industry

<sup>a</sup>Current dollars

**Table 6b. The Animal Agriculture Sector's Direct Contribution to Arkansas' Economy, 2006 Revised**

	<b>Employment<sup>a</sup></b>			<b>Labor Income<sup>b</sup></b>			<b>Value-Added<sup>c</sup></b>		
	Number of Jobs	% Total Contribution	% Total Arkansas Jobs	Million \$ <sup>d</sup>	% Total Contribution	% Total Arkansas Labor Income	Million \$	% Total Contribution	% Total Arkansas Value Added
Production <sup>e</sup>	25,334	39.5	1.6	415	24.0	0.7	1,218	44.9	1.4
Processing <sup>f</sup>	38,876	60.5	2.5	1,317	76.0	2.3	1,494	55.1	1.7
<b>Direct Contribution</b>	<b>64,210</b>	<b>100.0</b>	<b>4.1</b>	<b>1,732</b>	<b>100.0</b>	<b>3.0</b>	<b>2,711</b>	<b>100.0</b>	<b>3.0</b>

Source: Computed using the 2006 Arkansas database from MIG (2008)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)

<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)

<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

<sup>d</sup> Current dollars

<sup>e</sup> Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors

<sup>f</sup> Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors

# The Forestry Sector

The Forestry Sector is primarily comprised of commercial logging, forest products, furniture and wood and paper processing enterprises (Appendix B, Table 3). The Forestry Sector's direct contribution to the state economy is measured by the sum of the contributions of forestry production and processing. There were 33,259 jobs (2.1%

of state employment) in the Forestry Sector in 2007, and these workers and business owners received \$1.6B in labor income, or 2.7% of state labor income. The Forestry Sector added \$2.8B of value to the state economy, or 3.0% of total state value-added (Table 7a and Box 9). Within this sector, *Sawmills, Logging, and Paper and Paperboard Mills* comprise 46% of forestry jobs, and over half of forestry income and value added (Box 10). Details can be found in Appendix C, Table 4a. These contributions are summarized in Table 7a. According to the revised estimates for 2006, the Forestry Sectors direct contribution to the state in that year was 35,487 jobs (2.3% of state jobs), \$1.8B in income (3.1% of state income) and almost \$3.0B in value added (3.3% of state value added). Full details on the revised estimates for the Forestry

Sector for 2006 can be found in Table 7b and Appendix C, Table 4b.

### Box 9. Direct Contribution to the Forestry Sector, 2007<sup>a</sup>

<b>Employment</b>	33,259 jobs
<b>Wages</b>	\$1.46B
<b>Labor Income</b>	\$1.60B
<b>Value-Added</b>	\$2.83B

<sup>a</sup>Current dollars

### Box 10. Top Four Forestry Sectors Sawmills, Logging, and Paper and Paperboard Mills Contribute<sup>a</sup>:

<b>Employment</b>	15,258 jobs (46% of all forestry jobs)
<b>Wages</b>	\$689.49M (47% of Forestry wages)
<b>Labor Income</b>	\$798.28M (50% of Forestry labor income)
<b>Value-Added</b>	\$1.56B (55% of Forestry value added)

<sup>a</sup>Current dollars

**Table 7a. The Forestry Sector's Direct Contribution to Arkansas' Economy, 2007**

	Employment <sup>a</sup>			Labor Income <sup>b</sup>			Value-Added <sup>c</sup>		
	Number of Jobs	% Total Contribution	% Total Arkansas Jobs	Million \$ <sup>d</sup>	% Total Contribution	% Total Arkansas Labor Income	Million \$	% Total Contribution	% Total Arkansas Value Added
Production <sup>e</sup>	6,161	18.5	0.4	224	14.0	0.4	844	29.9	0.9
Processing <sup>f</sup>	27,098	81.5	1.7	1,378	86.0	2.3	1,984	70.1	2.1
<b>Direct Contribution</b>	<b>33,259</b>	<b>100.0</b>	<b>2.1</b>	<b>1,602</b>	<b>100.0</b>	<b>2.7</b>	<b>2,828</b>	<b>100.0</b>	<b>3.0</b>

Source: Computed using the 2007 Arkansas database from MIG (2009)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)

<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)

<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

<sup>d</sup> Current dollars

<sup>e</sup> Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors

<sup>f</sup> Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors

**Table 7b. The Forestry Sector's Direct Contribution to Arkansas' Economy, 2006 Revised**

	Employment <sup>a</sup>			Labor Income <sup>b</sup>			Value-Added <sup>c</sup>		
	Number of Jobs	% Total Contribution	% Total Arkansas Jobs	Million \$ <sup>d</sup>	% Total Contribution	% Total Arkansas Labor Income	Million \$	% Total Contribution	% Total Arkansas Value Added
Production <sup>e</sup>	5,699	16.1	0.4	205	11.6	0.4	359	12.0	0.4
Processing <sup>f</sup>	29,788	83.9	1.9	1,563	88.4	2.7	2,629	88.0	2.9
<b>Direct Contribution</b>	<b>35,487</b>	<b>100.0</b>	<b>2.3</b>	<b>1,768</b>	<b>100.0</b>	<b>3.1</b>	<b>2,987</b>	<b>100.0</b>	<b>3.3</b>

Source: Computed using the 2006 Arkansas database from MIG (2008)

<sup>a</sup> Equivalent to full- and part-time jobs (MIG, 2009)

<sup>b</sup> Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2009)

<sup>c</sup> Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

<sup>d</sup> Current dollars

<sup>e</sup> Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors

<sup>f</sup> Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors

## Summary

The GDP by State data from the Bureau of Economic Analysis 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 states of the southeastern US. According to 2007 IMPLAN data and subsequent analyses, about 16 cents of every dollar of the total state value added and 1 in 6 jobs can be attributed to agriculture. One in six dollars of labor income can be attributed to agriculture as well.

While record cash receipts for Arkansas commodities were set in 2007, on-farm expenses were also on the rise. Crop production values have been on the rise since 2005, due to a strong foreign demand and demand from the domestic biofuels industry; the increased prices have been high enough to outpace

increasing expenses, for the most part. In the Animal Agriculture Sector, cash receipts rose in 2007 but the increased costs of production offset most of the gains in income. Most agricultural manufacturing sectors declined in 2007, with the exception the food manufacturing sector which benefited from the record high levels of production. From 1997 to 2002, Agriculture and Food's share of GDP by State was on a slow decline. Much of that decline through 2001 was attributed to loss of value due to price pressures for agricultural commodities and an oversupply of processed agricultural goods relative to demand. However, Agriculture and Food's share of GDP by state increased in 2003 and 2004. After two years of decline, the Agriculture and Food Sector rebounded in 2007 due to higher agricultural prices and strong overseas and domestic demand.

IMPLAN data and the analysis indicate that the Arkansas Aggregate Agriculture Sector plays a significant role in generating jobs, income and value added throughout the state's economy. The record high levels of cash receipts in the production agriculture sectors in 2007 is reflected in the economic contribution analysis by an increase from 2006 of a 7% in jobs, a 21% increase in income and a 15% increase in value added.

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 GDP by State data are for years 1997-2007. IMPLAN data for Arkansas are for the years 2006 and 2007. The value of production data from USDA, ERS, and USDA NASS used in Figures 7 and 8 are for 1991-2007.
- 2 Throughout this report, all numerical references to agricultural trends are calculated using constant dollars, unless noted otherwise. The use of constant dollars factors in the effects of inflation, other economic fluctuations on price, and changes in the costs of inputs and allows for a value comparison over time. Constant dollars are derived from the Bureau of Economic Analysis' (BEA's) 2000 chained-dollar series, adjusted to a base year of 2007. The BEA uses industry-specific deflators to adjust current dollars to constant dollars.
- 3 SIC definitions, used to categorize GDP by State and IMPLAN data in some previous reports, were based upon what was produced. It 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*, where 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 re-allocations within super sectors and had no impact on overall totals.
- 4 GDP by State is a measurement of economic activity in the state economy. GDP by State is a similar measure to value added as defined by MIG, or the sum of employee compensation, proprietary income (e.g., rent payments), and indirect business taxes (e.g., sales taxes paid by individuals to firms). GDP by State is also equivalent to gross output minus the cost of intermediate output. However, GDP by State and value added are based on different data and estimated using different methodologies. Thus, while

- they are essentially the same measure, the estimated values are different.
- 5 The BEA defines agricultural production as Agriculture, Forestry, and Fishing and Hunting. They define agricultural processing as: Wood Product Manufacturing; Furniture and Related Products Manufacturing; Food Manufacturing; Textile and Textile Product Mills; Apparel, Leather and Allied Products Manufacturing; and Paper Manufacturing.
  - 6 The BEA includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia in the Southeast region.
  - 7 GDP is the national equivalent to GDP by State.
  - 8 Due to the greater detail of NAICS industries, some processing sectors that were included in SIC industries considered agriculture are now reclassified under NAICS industries not considered agricultural processing. Thus, it appears that the value of GDP by State has fallen in recent years (when compared to previous reports). The correct interpretation of this change is that it is now possible to more accurately define agriculture.
  - 9 One important change in recent years occurred in the poultry production sector where large productivity gains have been experienced. The amount of labor required to produce the same output on poultry farms has decreased and the majority of poultry output is increasingly produced on fewer acres. This is reflected in the employment number associated with poultry production in this report which has decreased since the 2001 report. The reason for such a drop reflects productivity gains occurring over the past 10 or more years that were only recently adjusted for in the IMPLAN data set.
  - 10 Appendix C provides the total contributions for the Aggregate Agricultural Sector and the direct contributions for the Crops, Animal Agriculture, and Forestry Sectors for the revised 2006 estimates and 2007.
  - 11 The 2007 study brings the GDP by State definitions for agricultural production and processing in line with the impact analysis definition of Agriculture and Food for the first time. GDP by State is reported for agricultural retail but the output from this sector is not included in the economic contribution analysis and is not used to direct contributions of the Agriculture Sector. However, this sector does represent an important contribution through the purchases it makes from direct agricultural sectors and these contributions are captured in the indirect contributions analysis.

## Literature Cited

- Alward, G. and Lindall, S. 1996. "Deriving SAM Multiplier Models using IMPLAN." Paper presented at 1996 IMPLAN user conference.
- American Forest and Paper Association. 2009. Forest and paper industry at a glance: Arkansas, Mississippi, Oklahoma, Tennessee. <http://www.afandpa.org/legislation/state/eis>. Accessed 12 Oct. 2009.
- Arkansas Forest Resources Center, 2009. University of Arkansas Division of Agriculture and University of Arkansas at Monticello. P.O. Box 3468, 110 University Court, Monticello, AR 71656. <http://www.afrc.uamont.edu/>
- Arkansas Forestry Commission. 2009. Data for 2009. 3821 West Roosevelt Rd. Little Rock, AR 72204. <http://www.forestry.state.ar.us/>
- 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 Division of Agriculture, Fayetteville.
- Lindall, S., 1998. "How Does MIG Estimate that Pesky Agricultural Data Anyway?" An MIG Knowledge Base Article. Minnesota IMPLAN Group, Inc. 1725 Tower Drive West, Suite 140, Stillwater, MN 55082.
- Minnesota IMPLAN Group, Inc. (MIG). 2008. IMPLAN System. 2006 Data and Software. 1725 Tower Drive West, Suite 140, Stillwater, MN 55082. <http://www.implan.com>
- Minnesota IMPLAN Group, Inc. (MIG). 2009. IMPLAN System. 2007 Data and Software. 1725 Tower Drive West, Suite 140, Stillwater, MN 55082. <http://www.implan.com>
- Olson, D. and S. Lindall. 2009 IMPLAN Professional 2.0 Software, Analysis, and Data Guide Minnesota IMPLAN Group, Inc. Stillwater, MN.
- 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 Division of Agriculture, Fayetteville, Arkansas.
- 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 Division of Agriculture, Fayetteville, Arkansas.
- Schuler, A., R. Taylor, and P. Araman. 2001. Competitiveness of U.U. wood furniture manufacturers: lessons learned from the softwood molding industry. *Forest Prod. J.*, 55:14-20.
- Simard, G. 1999. *The Logging Industry*. Statistics Canada, Manufacturing, Construction and Energy Division, 1999, <http://www.statcan.ca>.
- Stevens, B. and G. Trainor. 1980. "Error Generation on Regional Input-Output Analysis and its Implications for Non-Survey Models". Ed. S. Pleeter. *Economic Impact Analysis: Methodology and Applications*. Amsterdam: Marinus Nijhoff, 1980, p. 68-84.
- U.S. Census. Bureau (USCB). 2006. North American Classification System (NAICS). <http://www.census.gov/eos/www/naics/>. Accessed 10 Nov. 2009.
- U.S. Chamber of Commerce. (USCC). 2002. Trade promotion authority and

- Arkansas. <http://www.uschamber.org/>.
- U.S. Department of Agriculture Economic Research Service (USDA, ERS). 2006. U.S. and state farm income data. <http://www.ers.usda.gov/data/farmincome/finfidmu.htm>. Accessed 20 February 2006.
- U.S. Department of Agriculture Economic Research Service (USDA, ERS). 2008a. Measuring Agriculture's Contribution to Gross Domestic Product. <http://www.ers.usda.gov/AmberWaves/About/AgGDP.htm>. Accessed 8 January 2008.
- U.S. Department of Agriculture Economic Research Service (USDA, ERS). 2008b. Global Agricultural Supply and Demand: Factors Contributing to the Recent Increase in Food Commodity Prices/ WRS-0801 <http://www.ers.usda.gov/Publications/WRS0801/WRS0801.pdf>
- U.S. Department of Agriculture Economic Research Service (USDA, ERS). 2008c. Food Marketing System in the U.S. <http://www.ers.usda.gov/Briefing/FoodMarketingSystem/>
- U.S. Department of Agriculture Economic Research Service (USDA, ERS). 2008d. U.S. Textile and Apparel Industries and Rural America. <http://www.ers.usda.gov/Briefing/Cotton/USTextileApparel.htm>
- U.S. Department of Agriculture Economic Research Service (USDA, ERS). 2009. Farm Income and Costs: 2007 Farm Sector Income Estimates. ERS/USDA Briefing Room - Farm Income and Costs. <http://www.ers.usda.gov/Briefing/FarmIncome>
- U.S. Department of Agriculture, Foreign Agricultural Service (USDA, FAS). 2001. Trade and agriculture: What's at stake for Arkansas? <http://www.fas.usda.gov/info/factsheets/WTO/states/ar.asp>. Accessed 10 Nov. 2009.
- U.S. Department of Agriculture Forest Service. 2009. U.S. Forest Products, Annual Market Review and Prospects, 2004–2008. [http://www.fpl.fs.fed.us/documnts/fplrn/fpl\\_rn305.pdf](http://www.fpl.fs.fed.us/documnts/fplrn/fpl_rn305.pdf)
- U.S. Department of Agriculture, National Agricultural Statistics Service (USDA, NASS). 2008. Arkansas commodity production data. <http://www.nass.usda.gov>
- U.S. Department of Commerce, Bureau of Economic Analysis, (BEA). 2008. Glossary. <http://www.bea.gov/glossary/glossary.cfm?letter=G>. Accessed 10 Aug. 2008.
- U.S. Department of Commerce, Bureau of Economic Analysis, (BEA). 2009a. About Gross Domestic Product by State. <http://www.bea.gov/regional/gsp/readmeNAICS.cfm>. Accessed 10 Nov. 2009.
- Wall, H. J. 2000. Now and forever NAFTA. <http://research.stlouisfed.org/publications/regional/00/04/NAFTA.pdf>. Accessed 10 Nov. 2009.



## Appendix A

### *SIC and NAICS Classification Related to Agricultural Manufacturing*

**Table 1. Comparison of SIC and NAICS Manufacturing Components**

Industry	1997 SIC Description	1997 NAICS Description
WOOD PRODUCT MANUFACTURING	Logging was part of wood product manufacturing	Logging is now a part of ag production; portion of the old sector 3131 Boot and Shoe Cut Stock and Findings (wood heels) is now included
FURNITURE AND RELATED PRODUCTS MANUFACTURING	Sector used to contain value that are now a part of sector 33636 Motor Vehicle Seating and Interior Trim Manufacturing (pt) and 339111 Laboratory Apparatus and Furniture Manufacturing (pt)	This industry now contains the full value of what was classified by SIC as 2434 Wood Kitchen Cabinets; *5712 Furniture Stores (custom wood cabinets); *5712 Furniture (custom made upholstered household furniture except cabinets); *3952 Lead Pencils, Crayons, and Artist's Materials (drafting tables and boards); *3999 Manufacturing Industries, NEC (beauty and barber chairs); *3089 Plastics Products, NEC (finished plastics furniture parts); *3429 Hardware, NEC (convertible bed sleeper mechanisms, chair glides); *3499 Fabricated Metal Products, NEC (metal furniture frames)
FOOD MANUFACTURING		This industry now is defined with whole and portions of sectors that either did not exist in the SIC industries or was elsewhere classified or both. This industry now contains Tobacco products manufacturing; now includes a portion of what used to be *0723 Crop Production Services for Market, Except Cotton Ginning (custom grain grinding); *5441 Candy, Nut, and Confectionery Stores (chocolate candy stores, preparing on premises); *0751 Livestock Services, Except Veterinary (custom slaughtering); *5147 Meat and Meat Products (boxed beef); *5461 Retail Bakeries (bread, cake and related products baked and sold on premise).

**Table 1. (Continued)**

Industry	1997 SIC Description	1997 NAICS Description
TOBACCO PRODUCTS		Now a part of food products
TEXTILE AND TEXTILES PRODUCT MILLS	This used to contain: 315111 Sheer Hosiery Mills (pt); 315119 Other Hosiery and Sock Mills ; 315192 Underwear and Nightwear Knitting Mills (pt); 315191 Outerwear Knitting Mills (pt);	315 Apparel Manufacturing and 316 Leather and Allied Product Manufacturing are now combined into one sector, "Apparel Manufacturing"; this now contains portions of the following sectors: *5131 Piece Goods and Notions (broadwoven piece good converters); *7389 Business Services, NEC (sponging fabric for tailors and dressmakers); *3069 Fabricated Rubber Products, NEC (rubberizing fabric or purchased textile products);*5714 Drapery, Curtain, and Upholstery Stores (custom drapes); *5714 Drapery, Curtain, and Upholstery Stores (custom slipcovers); *3569 General Industrial Machinery and Equipment, NEC (textile fire hose); *7389 Business Services, NEC (embroidery of advertising on shirts and rug binding for the trade).
PAPER MANUFACTURING	Contained sector 326112 Unsupported Plastics Packaging Film and Sheet Manufacturing; 326111 Unsupported Plastics Bag Manufacturing	Now a portion of what used to be "Fabricated Metal Products" sector 3497 Metal Foil and Leaf (laminated aluminum foil rolls and sheets for flexible packaging uses) is part of Paper Manufacturing

## Appendix B

### *Description of IMPLAN Sectors and Aggregation Schemes*

**Table 1. Major Components of the Crops Sector as Defined by IMPLAN Sectors, 2007**

Aggregate Sector	Sector ID	IMPLAN Sector
CROPS PRODUCTION	1	Oilseed farming
	2	Grain farming
	3	Vegetable and melon farming
	4	Fruit farming
	5	Tree nut farming
	6	Greenhouse, nursery, and floriculture production
	7	Tobacco farming
	8	Cotton farming
	9	Sugarcane and sugar beet farming
	10	All other crop farming
CROPS PROCESSING	43	Flour milling and malt manufacturing
	44	Wet corn milling
	45	Soybean and other oilseed processing
	46	Fats and oils refining and blending
	47	Breakfast cereal manufacturing
	48	Sugar cane mills and refining
	49	Beet sugar manufacturing
	50	Chocolate and confectionery manufacturing from cacao beans
	51	Confectionery manufacturing from purchased chocolate
	52	Nonchocolate confectionery manufacturing
	53	Frozen food manufacturing
	54	Fruit and vegetable canning, pickling, and drying
	62	Bread and bakery product manufacturing
	63	Cookie, cracker, and pasta manufacturing
	64	Tortilla manufacturing
	65	Snack food manufacturing
	66	Coffee and tea manufacturing
	67	Flavoring syrup and concentrate manufacturing
	68	Seasoning and dressing manufacturing
	69	All other food manufacturing
	70	Soft drink and ice manufacturing
	71	Breweries
	72	Wineries
	73	Distilleries
	74	Tobacco product manufacturing
	75	Fiber, yarn, and thread mills
	76	Broadwoven fabric mills
	77	Narrow fabric mills and schiffli machine embroidery
	78	Nonwoven fabric mills
	79	Knit fabric mills
	80	Textile and fabric finishing mills
	81	Fabric coating mills
	82	Carpet and rug mills
83	Curtain and linen mills	

**Table 1. (Continued)**

Aggregate Sector	Sector ID	IMPLAN Sector
CROPS PROCESSING	84	Textile bag and canvas mills
	85	All other textile product mills
	86	Apparel knitting mills
	87	Cut and sew apparel contractors
	88	Men's and boys' cut and sew apparel manufacturing
	89	Women's and girls' cut and sew apparel manufacturing
	90	Other cut and sew apparel manufacturing
	91	Apparel accessories and other apparel manufacturing

**Table 2. Major Components of the Animal Agriculture Sector, Defined by IMPLAN Sectors, 2007**

Aggregated Sector	Sector ID	IMPLAN Sector
ANIMAL PRODUCTION	11	Cattle ranching and farming
	12	Dairy cattle and milk production
	13	Poultry and egg production
	14	Animal production, except cattle and poultry and eggs
ANIMAL PROCESSING	41	Dog and cat food manufacturing
	42	Other animal food manufacturing
	55	Fluid milk and butter manufacturing
	56	Cheese manufacturing
	57	Dry, condensed, and evaporated dairy product manf.
	58	Ice cream and frozen dessert manufacturing
	59	Animal (except poultry) slaughtering, rendering, & proc.
	60	Poultry processing
	61	Seafood product preparation and packaging
	92	Leather and hide tanning and finishing
93	Footwear manufacturing	
	94	Other leather and allied product manufacturing

**Table 3. Major Components of the Forestry Sector as Defined by IMPLAN Sectors, 2007**

Aggregated Sector	Sector ID	IMPLAN Sector	
FORESTRY PRODUCTION	15	Forestry, forest products, and timber tract production	
	16	Commercial logging	
	95	Sawmills and wood preservation	
	96	Veneer and plywood manufacturing	
	97	Engineered wood member and truss manufacturing	
	98	Reconstituted wood product manufacturing	
	99	Wood windows and doors and millwork manufacturing	
	100	Wood container and pallet manufacturing	
	101	Manufactured home (mobile home) manufacturing	
	102	Prefabricated wood building manufacturing	
	103	All other miscellaneous wood product manufacturing	
	104	Pulp mills	
	105	Paper mills	
	106	Paperboard Mills	
	107	Paperboard container manufacturing	
	FORESTRY PROCESSING	108	Coated and laminated paper, packaging paper and plastics film manf.
		109	All other paper bag and coated and treated paper manufacturing
110		Stationery product manufacturing	
111		Sanitary paper product manufacturing	
112		All other converted paper product manufacturing	
295		Wood kitchen cabinet and countertop manufacturing	
296		Upholstered household furniture manufacturing	
297		Nonupholstered wood household furniture manufacturing	
300		Wood television, radio, and sewing machine cabinet manufacturing	
301		Office furniture and custom archit. woodwork and millwork manf.	

**Table 4. Major Components of the Agriculture Related Sector as Defined by IMPLAN Sectors, 2007**

Aggregated Sector	Sector ID	IMPLAN Sector
AGRICULTURE RELATED	17	Commercial Fishing
	18	Commercial hunting and trapping
	19	Support activities for agriculture and forestry

**Table 5. Major Components of Agricultural Production and Agriculture Related as Defined by IMPLAN Sectors**

Aggregated Sector	IMPLAN Sector
CROPS PRODUCTION	Oilseed farming; Grain farming; Vegetable and melon farming; Tree nut farming; Fruit farming; Greenhouse and nursery production; Tobacco farming; Cotton farming; Sugarcane and sugar beet farming; All other crop farming
ANIMAL PRODUCTION	Cattle ranching and farming; Poultry and egg production; Animal production- except cattle and poultry and egg
FORESTRY PRODUCTION	Forest nurseries- forest products- and timber track; Logging
AGRICULTURE RELATED	Fishing; Hunting and trapping; Agriculture and forestry support activities

**Table 6. Major Components of Agricultural Processing as Defined by IMPLAN Sectors**

Aggregate Sector	IMPLAN Sector
CROPS PROCESSING	<p>Flour milling; Rice milling; Malt manufacturing; Wet corn milling; Soybean processing; Other oilseed processing; Fats and oils refining and blending; Breakfast cereal manufacturing; Sugar manufacturing; Confectionery manufacturing from cacao beans; Confectionery manufacturing from purchased chocolate; Nonchocolate confectionery manufacturing; Frozen food manufacturing; Fruit and vegetable canning and drying; Frozen cakes and other pastries manufacturing; Bread and bakery product- except frozen- manufacturing; Cookie and cracker manufacturing; Mixes and dough made from purchased flour; Dry pasta manufacturing; Tortilla manufacturing; Roasted nuts and peanut butter manufacturing; Other snack food manufacturing; Coffee and tea manufacturing; Flavoring syrup and concentrate manufacturing; Mayonnaise- dressing- and sauce manufacturing; Spice and extract manufacturing; All other food manufacturing; Soft drink and ice manufacturing; Breweries; Wineries; Distilleries; Tobacco stemming and redrying; Cigarette manufacturing; Other tobacco product manufacturing; Fiber-yarn- and thread mills; Broadwoven fabric mills; Narrow fabric mills and schiffli embroidery; Nonwoven fabric mills; Knit fabric mills; Textile and fabric and tire fabric mills; Other miscellaneous textile product mills; Sheer hosiery mills; Other hosiery and sock mills; Other apparel knitting mills; Cut and sew apparel manufacturing; Accessories and other apparel manufacturing</p>
ANIMAL PROCESSING	<p>Dog and cat food manufacturing; Other animal food manufacturing; Fluid milk manufacturing; Creamery butter manufacturing; Cheese manufacturing; Dry- condensed- and evaporated dairy products; Ice cream and frozen dessert manufacturing; Animal- except poultry- slaughtering; Meat processed from carcasses; Rendering and meat byproduct processing; Poultry processing; Seafood product preparation and packaging; Leather and hide tanning and finishing; Footwear manufacturing; Other leather and allied product manufacturing</p>
FORESTRY PROCESSING	<p>Sawmills; Wood preservation; Reconstituted wood product manufacturing; Veneer and plywood manufacturing; Engineered wood member and truss manufacturing; Wood windows and door manufacturing; Cut stock- resawing lumber- and planning; Other millwork- including flooring; Wood container and pallet manufacturing; Prefabricated wood building manufacturing; Miscellaneous wood product manufacturing; Pulp mills; Paper and paperboard mills; Paperboard container manufacturing; Surface-coated paperboard manufacturing; Coated and laminated paper and packaging materials; Coated and uncoated paper bag manufacturing; Die-cut paper office supplies manufacturing; Envelope manufacturing; Stationery and related product manufacturing; Sanitary paper product manufacturing; All other converted paper product manufacturing; Wood kitchen cabinet and countertop manufacturing; Upholstered household furniture manufacturing; Non-upholstered wood household furniture manufacturing; Wood office furniture manufacturing; Custom architectural woodwork and millwork; Manufactured home, mobile home, manufacturing; Wood office furniture manufacturing; Office furniture, except wood, manufacturing</p>

## Appendix C

### Agriculture-Generated Activity by Sector

**Table 1a. Agriculture-Generated Activity by Sector, 2007**

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
60	Poultry processing	30,226	991.055	1,040.453
2	Grain farming	24,298	386.323	691.796
13	Poultry and egg production	10,481	302.497	649.505
19	Support activities for agriculture and forestry	10,223	291.356	249.465
319	Wholesale trade businesses	10,063	585.598	991.619
1	Oilseed farming	9,177	205.023	434.973
413	Food services and drinking places	8,370	119.429	169.285
335	Transport by truck	6,487	275.012	370.347
360	Real estate establishments	6,062	95.261	506.057
95	Sawmills and wood preservation	5,586	232.067	344.467
16	Commercial logging	5,508	192.502	635.293
53	Frozen food manufacturing	5,387	227.746	238.708
14	Animal production, except cattle and poultry and eggs	5,358	24.099	124.228
11	Cattle ranching and farming	4,539	22.504	96.925
8	Cotton farming	3,686	95.814	327.774
381	Management of companies and enterprises	3,345	276.866	344.006
394	Offices of physicians, dentists, and other health practitioners	3,101	194.154	218.138
107	Paperboard container manufacturing	3,024	174.839	177.500
397	Private hospitals	2,991	136.319	144.765
39	Maintenance and repair construction of nonres. structures	2,925	93.137	107.771
105	Paper mills	2,785	265.065	420.963
99	Wood windows and doors and millwork manufacturing	2,765	94.827	132.485
379	Veterinary services	2,720	66.580	73.149
10	All other crop farming	2,595	76.672	108.728
59	Animal (except poultry) slaughtering, rendering, and processing	2,549	107.243	113.944
382	Employment services	2,347	37.043	37.111
62	Bread and bakery product manufacturing	2,275	96.535	107.201
96	Veneer and plywood manufacturing	2,128	98.655	137.044
398	Nursing and residential care facilities	2,117	53.727	65.379
329	Retail Stores - General merchandise	2,072	47.226	70.541
354	Monetary authorities and depository credit interm. act.	2,036	89.961	265.083
414	Automotive repair and maintenance, except car washes	1,930	43.840	60.624
388	Services to buildings and dwellings	1,868	33.340	40.464
324	Retail Stores - Food and beverage	1,829	39.287	57.199
426	Private household operations	1,801	9.184	9.184
93	Footwear manufacturing	1,663	46.375	48.911
109	All other paper bag and coated and treated paper manuf.	1,650	79.158	83.985
111	Sanitary paper product manufacturing	1,625	104.481	210.899
320	Retail Stores - Motor vehicle and parts	1,610	62.241	86.308
43	Flour milling and malt manufacturing	1,560	73.732	99.813
54	Fruit and vegetable canning, pickling, and drying	1,426	69.828	132.082
106	Paperboard Mills	1,378	108.651	160.155
340	Warehousing and storage	1,325	47.960	59.646
295	Wood kitchen cabinet and countertop manufacturing	1,281	41.067	41.540
65	Snack food manufacturing	1,271	68.467	150.864
330	Retail Stores - Miscellaneous	1,264	18.601	27.125
400	Individual and family services	1,249	22.499	24.070
425	Civic, social, professional, and similar organizations	1,239	29.341	27.390

Table 1a. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Aggregate Agriculture Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
367	Legal services	1,160	59.065	78.328
100	Wood container and pallet manufacturing	1,141	30.871	41.203
368	Accounting, tax preparation, bookkeeping, and payroll services	1,121	46.851	51.145
85	All other textile product mills	1,090	55.426	82.537
42	Other animal food manufacturing	1,071	64.804	89.089
323	Retail Stores - Building material and garden supply	1,030	30.311	51.221
333	Transport by rail	987	87.957	169.319
327	Retail Stores - Clothing and clothing accessories	964	14.682	28.942
70	Soft drink and ice manufacturing	961	63.491	66.736
399	Child day care services	925	13.247	18.867
411	Hotels and motels, including casino hotels	910	16.488	29.046
369	Architectural, engineering, and related services	906	47.794	48.155
432	Other state and local government enterprises	906	44.390	63.447
356	Securities, commodity contracts, investments, and related	873	41.129	40.445
296	Upholstered household furniture manufacturing	812	27.667	30.483
325	Retail Stores - Health and personal care	793	23.478	33.297
326	Retail Stores - Gasoline stations	745	15.712	30.081
86	Apparel knitting mills	733	22.483	26.060
386	Business support services	680	13.901	16.932
297	Nonupholstered wood household furniture manufacturing	677	21.896	27.127
97	Engineered wood member and truss manufacturing	668	24.228	37.219
15	Forestry, forest products, and timber tract production	652	31.757	208.983
427	US Postal Service	648	52.108	53.774
149	Other plastics product manufacturing	634	23.554	33.596
396	Medical and diagnostic labs and outpatient and other	622	26.068	43.032
98	Reconstituted wood product manufacturing	600	35.137	90.084
374	Management, scientific, and technical consulting services	583	30.305	32.649
20	Extraction of oil and natural gas	574	50.823	119.996
357	Insurance carriers	573	30.142	46.555
339	Couriers and messengers	573	18.566	24.430
391	Private elementary and secondary schools	569	9.200	9.358
18	Commercial hunting and trapping	566	3.653	16.356
328	Retail Stores - Sporting goods, hobby, book and music	557	8.307	12.956
88	Men's and boys' cut and sew apparel manufacturing	546	12.531	14.532
355	Nondepository credit intermediation and related activities	519	27.454	47.059
401	Community food, housing, and other relief services	513	10.256	10.801
63	Cookie, cracker, and pasta manufacturing	513	27.523	41.210
6	Greenhouse, nursery, and floriculture production	505	20.642	29.266
419	Personal care services	490	6.007	9.223
417	Com. and ind. machinery and equipment repair and maint.	490	16.458	26.266
142	Plastics packg materials manuf.	482	25.711	46.168
338	Scenic and sightseeing transportation and support activities	469	24.825	31.701
392	Private junior colleges, colleges, universities and prof. schools	460	11.077	11.422
393	Other private educational services	448	10.452	13.490
395	Home health care services	433	13.771	16.156
421	Dry-cleaning and laundry services	429	7.103	10.489
321	Retail Stores - Furniture and home furnishings	427	14.713	23.457
387	Investigation and security services	416	9.387	9.962



**Table 1a. (Continued)**

Sector ID	Aggregate Agriculture Contribution to:	Aggregate Agriculture Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
31	Electric power generation, transmission, and distribution	1,202	128.163	452.883
331	Retail Nonstores - Direct and electronic sales	1,191	11.315	32.320
367	Legal services	1,160	59.065	78.328
100	Wood container and pallet manufacturing	1,141	30.871	41.203
368	Accounting, tax preparation, bookkeeping, and payroll services	1,121	46.851	51.145
85	All other textile product mills	1,090	55.426	82.537
42	Other animal food manufacturing	1,071	64.804	89.089
323	Retail Stores - Building material and garden supply	1,030	30.311	51.221
333	Transport by rail	987	87.957	169.319
327	Retail Stores - Clothing and clothing accessories	964	14.682	28.942
70	Soft drink and ice manufacturing	961	63.491	66.736
399	Child day care services	925	13.247	18.867
411	Hotels and motels, including casino hotels	910	16.488	29.046
369	Architectural, engineering, and related services	906	47.794	48.155
432	Other state and local government enterprises	906	44.390	63.447
356	Securities, commodity contracts, investments, and related activities	873	41.129	40.445
296	Upholstered household furniture manufacturing	812	27.667	30.483
325	Retail Stores - Health and personal care	793	23.478	33.297
326	Retail Stores - Gasoline stations	745	15.712	30.081
86	Apparel knitting mills	733	22.483	26.060
386	Business support services	680	13.901	16.932
297	Nonupholstered wood household furniture manufacturing	677	21.896	27.127
97	Engineered wood member and truss manufacturing	668	24.228	37.219
15	Forestry, forest products, and timber tract production	652	31.757	208.983
427	US Postal Service	648	52.108	53.774
149	Other plastics product manufacturing	634	23.554	33.596
396	Medical and diagnostic labs and outpatient and other ambulatory ca	622	26.068	43.032
98	Reconstituted wood product manufacturing	600	35.137	90.084
374	Management, scientific, and technical consulting services	583	30.305	32.649
20	Extraction of oil and natural gas	574	50.823	119.996
357	Insurance carriers	573	30.142	46.555
339	Couriers and messengers	573	18.566	24.430
391	Private elementary and secondary schools	569	9.200	9.358
18	Commercial hunting and trapping	566	3.653	16.356
328	Retail Stores - Sporting goods, hobby, book and music	557	8.307	12.956
88	Men's and boys' cut and sew apparel manufacturing	546	12.531	14.532
355	Nondepository credit intermediation and related activities	519	27.454	47.059
401	Community food, housing, and other relief services, including rehal	513	10.256	10.801
63	Cookie, cracker, and pasta manufacturing	513	27.523	41.210
6	Greenhouse, nursery, and floriculture production	505	20.642	29.266
419	Personal care services	490	6.007	9.223
417	Commercial and industrial machinery and equipment repair and ma	490	16.458	26.266
142	Plastics packaging materials and unlaminated film and sheet manuf	482	25.711	46.168
338	Scenic and sightseeing transportation and support activities for tran	469	24.825	31.701
392	Private junior colleges, colleges, universities, and professional scho	460	11.077	11.422
393	Other private educational services	448	10.452	13.490
395	Home health care services	433	13.771	16.156
421	Dry-cleaning and laundry services	429	7.103	10.489

Table 1a. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Aggregate Agriculture Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
321	Retail Stores - Furniture and home furnishings	427	14.713	23.457
387	Investigation and security services	416	9.387	9.962
372	Computer systems design services	408	28.445	25.462
34	Construction of new nonresidential commercial and health care stru	391	12.739	14.010
377	Advertising and related services	388	15.609	19.044
37	Construction of new residential permanent site single- and multi-fa	381	12.417	17.173
41	Dog and cat food manufacturing	372	14.732	37.223
403	Spectator sports companies	353	3.230	3.912
409	Amusement parks, arcades, and gambling industries	342	5.411	11.296
424	Grantmaking, giving, and social advocacy organizations	342	8.960	7.675
12	Dairy cattle and milk production	339	1.406	17.520
64	Tortilla manufacturing	330	11.686	14.257
407	Fitness and recreational sports centers	325	4.344	4.637
410	Other amusement and recreation industries	325	5.849	7.892
322	Retail Stores - Electronics and appliances	325	8.710	11.588
91	Apparel accessories and other apparel manufacturing	321	8.241	8.077
351	Telecommunications	292	41.427	128.424
380	All other miscellaneous professional, scientific, and technical servi	286	7.560	42.010
341	Newspaper publishers	275	8.663	11.842
108	Coated and laminated paper, packaging paper and plastics film man	267	16.236	20.275
418	Personal and household goods repair and maintenance	266	6.073	12.870
32	Natural gas distribution	262	24.725	61.200
362	Automotive equipment rental and leasing	261	11.904	19.456
103	All other miscellaneous wood product manufacturing	261	7.231	11.243
55	Fluid milk and butter manufacturing	252	12.608	17.226
348	Radio and television broadcasting	249	21.964	22.657
416	Electronic and precision equipment repair and maintenance	243	9.089	15.354
45	Soybean and other oilseed processing	242	11.538	16.018
68	Seasoning and dressing manufacturing	242	7.934	8.778
390	Waste management and remediation services	232	9.597	15.389
376	Scientific research and development services	229	11.703	10.674
46	Fats and oils refining and blending	225	8.839	16.103
94	Other leather and allied product manufacturing	209	7.741	8.984
415	Car washes	201	2.181	3.730
301	Office furniture and custom architectural woodwork and millwork r	199	6.802	7.207
389	Other support services	196	5.846	12.115
358	Insurance agencies, brokerages, and related activities	194	8.254	9.302
56	Cheese manufacturing	192	8.106	9.513
404	Promoters of performing arts and sports and agents for public figur	191	2.449	3.053
58	Ice cream and frozen dessert manufacturing	186	9.483	14.493
4	Fruit farming	184	1.194	0.791
336	Transit and ground passenger transportation	182	2.738	3.471
113	Printing	180	8.165	9.059
40	Maintenance and repair construction of residential structures	173	7.878	9.439
141	All other chemical product and preparation manufacturing	171	13.046	18.329
47	Breakfast cereal manufacturing	170	8.831	21.671
17	Commercial Fishing	169	1.089	2.568
420	Death care services	164	4.344	4.460

**Table 1a. (Continued)**

Sector ID	Aggregate Agriculture Contribution to:	Aggregate Agriculture Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
69	All other food manufacturing	158	4.654	5.486
365	Commercial and industrial machinery and equipment rental and lea	157	10.134	18.050
110	Stationery product manufacturing	156	5.457	5.875
402	Performing arts companies	155	0.935	1.458
384	Office administrative services	154	8.574	13.556
78	Nonwoven fabric mills	153	11.272	13.064
3	Vegetable and melon farming	153	12.562	14.361
429	Other Federal Government enterprises	149	12.581	12.976
422	Other personal services	147	2.775	9.063
84	Textile bag and canvas mills	141	5.532	5.736
344	Directory, mailing list, and other publishers	137	5.324	11.824
36	Construction of other new nonresidential structures	135	4.429	4.772
363	General and consumer goods rental except video tapes and discs	130	4.368	4.673
359	Funds, trusts, and other financial vehicles	127	3.684	4.467
73	Distilleries	126	11.787	85.049
38	Construction of other new residential structures	125	4.076	6.049
76	Broadwoven fabric mills	124	6.758	6.999
87	Cut and sew apparel contractors	121	2.011	2.337
44	Wet corn milling	121	7.796	10.451
423	Religious organizations	120	2.591	2.579
195	Machine shops	117	4.904	5.736
431	State and local government electric utilities	117	9.903	13.944
370	Specialized design services	117	4.271	6.423
158	Glass container manufacturing	112	5.030	9.345
71	Breweries	110	10.688	28.529
246	Printed circuit assembly (electronic assembly) manufacturing	110	4.086	4.568
346	Motion picture and video industries	108	1.896	2.579
375	Environmental and other technical consulting services	104	5.512	6.791
203	Farm machinery and equipment manufacturing	104	3.217	5.682
207	Other industrial machinery manufacturing	100	5.144	7.068
33	Water, sewage and other treatment and delivery systems	97	4.389	7.255
412	Other accommodations	97	1.987	3.070
373	Other computer related services, including facilities management	97	7.599	8.554
283	Motor vehicle parts manufacturing	95	5.076	5.710
364	Video tape and disc rental	92	1.325	1.942
125	All other basic inorganic chemical manufacturing	92	8.982	11.219
61	Seafood product preparation and packaging	86	1.679	1.785
57	Dry, condensed, and evaporated dairy product manufacturing	83	4.962	6.817
337	Transport by pipeline	79	8.014	10.099
148	Plastics bottle manufacturing	73	3.862	7.691
115	Petroleum refineries	73	8.094	22.703
190	Metal can, box, and other metal container (light gauge) manufacturi	72	4.673	9.190
430	State and local government passenger transit	71	3.065	0.390
35	Construction of new nonresidential manufacturing structures	71	2.304	3.010
332	Transport by air	69	4.424	6.013
80	Textile and fabric finishing mills	69	1.750	1.831
371	Custom computer programming services	67	3.518	3.592
126	Other basic organic chemical manufacturing	66	7.067	16.942

Table 1a. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Aggregate Agriculture Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
72	Wineries	65	4.949	6.653
51	Confectionery manufacturing from purchased chocolate	60	1.277	2.283
143	Unlaminated plastics profile shape manufacturing	60	2.727	4.686
302	Showcase, partition, shelving, and locker manufacturing	59	2.641	3.014
147	Urethane and other foam product (except polystyrene) manufacturii	56	3.102	5.428
101	Manufactured home (mobile home) manufacturing	55	1.822	1.967
383	Travel arrangement and reservation services	52	2.530	3.364
29	Support activities for oil and gas operations	51	3.143	4.161
131	Pesticide and other agricultural chemical manufacturing	50	3.655	18.063
405	Independent artists, writers, and performers	49	1.660	2.090
145	Laminated plastics plate, sheet (except packaging), and shape manu	47	1.963	2.835
130	Fertilizer manufacturing	47	4.026	6.177
52	Nonchocolate confectionery manufacturing	47	1.475	1.999
197	Coating, engraving, heat treating and allied activities	44	1.645	2.378
352	Data processing, hosting, ISP, web search portals and related servic	39	1.867	2.412
228	Material handling equipment manufacturing	38	1.728	2.252
138	Soap and cleaning compound manufacturing	36	3.258	12.590
220	Cutting tool and machine tool accessory manufacturing	36	1.815	2.173
334	Transport by water	36	2.429	4.277
140	Printing ink manufacturing	35	2.436	2.549
146	Polystyrene foam product manufacturing	35	1.529	2.897
50	Chocolate and confectionery manufacturing from cacao beans	33	0.990	1.246
378	Photographic services	33	0.588	0.948
308	Ophthalmic goods manufacturing	32	1.512	2.398
309	Dental laboratories manufacturing	30	1.443	1.479
342	Periodical publishers	30	1.328	1.817
122	Synthetic dye and pigment manufacturing	29	1.637	2.357
83	Curtain and linen mills	28	0.624	0.770
305	Surgical and medical instrument, laboratory and medical instrumen	27	1.522	1.984
28	Drilling oil and gas wells	26	1.882	9.656
247	Other electronic component manufacturing	26	0.598	0.611
102	Prefabricated wood building manufacturing	25	0.871	1.182
139	Toilet preparation manufacturing	24	1.854	6.881
240	Audio and video equipment manufacturing	24	1.012	1.197
267	Motor and generator manufacturing	24	1.260	1.905
144	Plastics pipe and pipe fitting manufacturing	23	1.221	2.612
132	Medicinal and botanical manufacturing	22	1.335	2.133
350	Internet publishing and broadcasting	21	0.526	1.226
242	Bare printed circuit board manufacturing	21	1.041	1.074
314	Sign manufacturing	21	0.833	0.901
243	Semiconductor and related device manufacturing	21	1.036	1.086
270	Storage battery manufacturing	18	1.449	1.662
5	Tree nut farming	18	1.057	1.721
366	Lessors of nonfinancial intangible assets	18	1.050	9.208
185	Handtool manufacturing	17	0.738	0.223
204	Lawn and garden equipment manufacturing	16	0.331	0.572
300	Wood television, radio, and sewing machine cabinet manufacturing	15	0.479	0.734
137	Adhesive manufacturing	15	1.624	2.042

**Table 1a. (Continued)**

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
198	Valve and fittings other than plumbing manufacturing	14	0.778	1.409
353	Other information services	14	0.342	0.675
66	Coffee and tea manufacturing	14	0.520	0.745
213	Other commercial and service industry machinery manufacturing	14	0.779	1.054
408	Bowling centers	14	0.183	0.311
279	Motor vehicle body manufacturing	14	0.784	0.827
385	Facilities support services	13	0.415	0.436
303	Mattress manufacturing	13	0.390	0.558
219	Special tool, die, jig, and fixture manufacturing	13	0.612	0.642
81	Fabric coating mills	13	0.712	0.741
306	Surgical appliance and supplies manufacturing	12	0.820	1.348
89	Women's and girls' cut and sew apparel manufacturing	12	0.450	0.511
234	Electronic computer manufacturing	12	0.858	0.859
21	Mining coal	12	1.208	2.166
307	Dental equipment and supplies manufacturing	12	0.512	0.735
406	Museums, historical sites, zoos, and parks	12	2.911	2.728
266	Power, distribution, and specialty transformer manufacturing	11	0.598	0.794
157	Other pressed and blown glass and glassware manufacturing	10	0.399	0.620
193	Hardware manufacturing	10	0.384	0.683
117	Asphalt shingle and coating materials manufacturing	10	1.077	2.714
118	Petroleum lubricating oil and grease manufacturing	9	0.633	1.420
135	Biological product (except diagnostic) manufacturing	9	0.475	0.990
248	Electromedical and electrotherapeutic apparatus manufacturing	9	0.472	0.510
275	All other miscellaneous electrical equipment and component manuf	9	0.432	0.526
298	Metal and other household furniture (except wood) manufacturing	8	0.367	0.460
282	Travel trailer and camper manufacturing	8	0.313	0.333
196	Turned product and screw, nut, and bolt manufacturing	8	0.336	0.479
317	All other miscellaneous manufacturing	8	0.291	0.346
67	Flavoring syrup and concentrate manufacturing	8	0.783	5.624
231	Packaging machinery manufacturing	8	0.473	0.513
75	Fiber, yarn, and thread mills	7	0.319	0.326
127	Plastics material and resin manufacturing	7	0.666	1.337
25	Mining and quarrying stone	7	0.443	0.922
345	Software publishers	7	0.452	0.805
27	Mining and quarrying other nonmetallic minerals	7	0.399	0.536
159	Glass product manufacturing made of purchased glass	7	0.344	0.503
194	Spring and wire product manufacturing	7	0.242	0.371
245	Electronic connector manufacturing	7	0.348	0.365
299	Institutional furniture manufacturing	7	0.292	0.348
272	Communication and energy wire and cable manufacturing	7	0.634	1.049
26	Mining and quarrying sand, gravel, clay, and ceramic and refractory	7	0.336	0.481
116	Asphalt paving mixture and block manufacturing	6	0.384	0.821
343	Book publishers	6	0.324	0.581
244	Electronic capacitor, resistor, coil, transformer, and other inductor r	6	0.273	0.291
92	Leather and hide tanning and finishing	6	0.221	0.220
133	Pharmaceutical preparation manufacturing	6	0.453	0.808
174	Aluminum product manufacturing from purchased aluminum	6	0.391	0.720
199	Plumbing fixture fitting and trim manufacturing	6	0.276	0.712

Table 1a. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Aggregate Agriculture Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
151	Rubber and plastics hoses and belting manufacturing	6	0.287	0.422
229	Power-driven handtool manufacturing	6	0.227	0.339
208	Plastics and rubber industry machinery manufacturing	5	0.248	0.292
230	Other general purpose machinery manufacturing	5	0.236	0.299
120	Petrochemical manufacturing	5	0.425	0.836
152	Other rubber product manufacturing	5	0.235	0.467
280	Truck trailer manufacturing	5	0.221	0.237
121	Industrial gas manufacturing	5	0.442	1.320
171	Steel product manufacturing from purchased steel	5	0.293	0.440
187	Ornamental and architectural metal products manufacturing	5	0.220	0.292
252	Totalizing fluid meters and counting devices manufacturing	4	0.151	0.158
262	Household cooking appliance manufacturing	4	0.163	0.264
172	Alumina refining and primary aluminum production	4	0.344	0.744
170	Iron and steel mills and ferroalloy manufacturing	4	0.509	1.045
251	Industrial process variable instruments manufacturing	4	0.162	0.167
311	Sporting and athletic goods manufacturing	4	0.178	0.224
349	Cable and other subscription programming	4	1.309	1.718
183	Crown and closure manufacturing and metal stamping	4	0.172	0.252
269	Relay and industrial control manufacturing	4	0.148	0.190
274	Carbon and graphite product manufacturing	4	0.175	0.275
201	Fabricated pipe and pipe fitting manufacturing	4	0.162	0.244
225	Other engine equipment manufacturing	4	0.158	0.273
289	Railroad rolling stock manufacturing	4	0.182	0.592
82	Carpet and rug mills	3	0.057	0.073
218	Metal cutting and forming machine tool manufacturing	3	0.202	0.249
284	Aircraft manufacturing	3	0.264	0.272
273	Wiring device manufacturing	3	0.157	0.246
186	Plate work and fabricated structural product manufacturing	3	0.181	0.287
260	Lighting fixture manufacturing	3	0.150	0.203
264	Household laundry equipment manufacturing	3	0.190	0.322
119	All other petroleum and coal products manufacturing	3	0.204	0.428
268	Switchgear and switchboard apparatus manufacturing	3	0.182	0.282
347	Sound recording industries	3	0.099	0.234
184	Cutlery, utensil, pot, and pan manufacturing	3	0.094	0.525
202	Other fabricated metal manufacturing	3	0.139	0.214
24	Mining gold, silver, and other metal ore	3	0.360	1.236
263	Household refrigerator and home freezer manufacturing	2	0.114	0.170
221	Rolling mill and other metalworking machinery manufacturing	2	0.140	0.161
256	Watch, clock, and other measuring and controlling device manufact	2	0.097	0.103
200	Ball and roller bearing manufacturing	2	0.113	0.213
224	Mechanical power transmission equipment manufacturing	2	0.072	0.090
237	Telephone apparatus manufacturing	2	0.156	0.172
291	Boat building	2	0.073	0.090
153	Pottery, ceramics, and plumbing fixture manufacturing	2	0.082	0.111
222	Turbine and turbine generator set units manufacturing	2	0.102	0.205
210	Vending, commercial, industrial, and office machinery manufacturi	2	0.065	0.081
114	Support activities for printing	2	0.046	0.072
315	Gasket, packing, and sealing device manufacturing	2	0.083	0.091

**Table 1a. (Continued)**

Sector ID	Aggregate Agriculture Contribution to:	Income		
		Employment (Jobs)	(Million \$)	Value Added (\$ Million)
257	Software, audio, and video media for reproduction	2	0.049	0.051
250	Automatic environmental control manufacturing	1	0.055	0.057
318	Broom, brush, and mop manufacturing	1	0.062	0.094
162	Concrete pipe, brick, and block manufacturing	1	0.058	0.110
286	Other aircraft parts and auxiliary equipment manufacturing	1	0.055	0.106
176	Primary smelting and refining of nonferrous metal (except copper a	1	0.064	0.132
192	Arms, ordnance, and accessories manufacturing	1	0.053	0.096
214	Air purification and ventilation equipment manufacturing	1	0.042	0.054
313	Office supplies (except paper) manufacturing	1	0.063	0.094
191	Ammunition manufacturing	1	0.049	0.102
211	Optical instrument and lens manufacturing	1	0.047	0.050
249	Search, detection, and navigation instruments manufacturing	1	0.049	0.050
150	Tire manufacturing	1	0.059	0.082
205	Construction machinery manufacturing	1	0.039	0.077
134	In-vitro diagnostic substance manufacturing	1	0.044	0.052
180	Nonferrous metal foundries	1	0.037	0.042
209	Semiconductor machinery manufacturing	1	0.093	0.134
217	Industrial mold manufacturing	1	0.029	0.030
236	Computer terminals and other computer peripheral equipment man	1	0.023	0.024
238	Broadcast and wireless communications equipment manufacturing	1	0.025	0.026
290	Ship building and repairing	1	0.039	0.051
316	Musical instrument manufacturing	1	0.027	0.027
216	Air conditioning, refrigeration, and warm air heating equipment ma	1	0.030	0.079
163	Other concrete product manufacturing	1	0.021	0.032
166	Cut stone and stone product manufacturing	1	0.014	0.015
177	Copper rolling, drawing, extruding and alloying	1	0.028	0.068
206	Mining and oil and gas field machinery manufacturing	1	0.026	0.033
233	Fluid power process machinery manufacturing	1	0.025	0.033
310	Jewelry and silverware manufacturing	1	0.031	0.036
181	All other forging, stamping, and sintering	0	0.020	0.026
261	Small electrical appliance manufacturing	0	0.016	0.026
276	Automobile manufacturing	0	0.029	0.033
285	Aircraft engine and engine parts manufacturing	0	0.028	0.039
161	Ready-mix concrete manufacturing	0	0.013	0.020
294	All other transportation equipment manufacturing	0	0.014	0.046
178	Nonferrous metal (except copper and aluminum) rolling, drawing, c	0	0.016	0.029
226	Pump and pumping equipment manufacturing	0	0.019	0.027
124	Carbon black manufacturing	0	0.018	0.035
312	Doll, toy, and game manufacturing	0	0.010	0.014
128	Synthetic rubber manufacturing	0	0.010	0.018
136	Paint and coating manufacturing	0	0.009	0.014
164	Lime and gypsum product manufacturing	0	0.009	0.027
165	Abrasive product manufacturing	0	0.007	0.015
168	Mineral wool manufacturing	0	0.003	0.007
169	Miscellaneous nonmetallic mineral product manufacturing	0	0.003	0.006
188	Power boiler and heat exchanger manufacturing	0	0.010	0.014
189	Metal tank (heavy gauge) manufacturing	0	0.006	0.009
227	Air and gas compressor manufacturing	0	0.006	0.007

Table 1a. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Income			Value Added (\$	
		Employment (Jobs)	(Million \$)		Million)	
239	Other communications equipment manufacturing	0	0.00		0.00	
253	Electricity and signal testing instruments manufacturing	0	0.00		0.01	
278	Heavy duty truck manufacturing	0	0.00		0.00	
292	Motorcycle, bicycle, and parts manufacturing	0	0.01		0.02	
7	Tobacco farming	0	0.00		0.00	
9	Sugarcane and sugar beet farming	0	0.00		0.00	
48	Sugar cane mills and refining	0	0.00		0.00	
49	Beet sugar manufacturing	0	0.00		0.00	
74	Tobacco product manufacturing	0	0.00		0.00	
77	Narrow fabric mills and schiffli machine embroidery	0	0.00		0.00	
79	Knit fabric mills	0	0.00		0.00	
90	Other cut and sew apparel manufacturing	0	0.00		0.00	
104	Pulp mills	0	0.00		0.00	
112	All other converted paper product manufacturing	0	0.00		0.00	
22	Mining iron ore	0	0.00		0.00	
23	Mining copper, nickel, lead, and zinc	0	0.00		0.00	
30	Support activities for other mining	0	0.00		0.00	
123	Alkalies and chlorine manufacturing	0	0.00		0.00	
129	Artificial and synthetic fibers and filaments manufacturing	0	0.00		0.00	
154	Brick, tile, and other structural clay product manufacturing	0	0.00		0.00	
155	Clay and nonclay refractory manufacturing	0	0.00		0.00	
156	Flat glass manufacturing	0	0.00		0.00	
160	Cement manufacturing	0	0.00		0.00	
167	Ground or treated mineral and earth manufacturing	0	0.00		0.01	
173	Secondary smelting and alloying of aluminum	0	0.00		0.01	
175	Primary smelting and refining of copper	0	0.00		0.00	
179	Ferrous metal foundries	0	0.00		0.00	
182	Custom roll forming	0	0.00		0.01	
212	Photographic and photocopying equipment manufacturing	0	0.00		0.00	
215	Heating equipment (except warm air furnaces) manufacturing	0	0.00		0.00	
223	Speed changer, industrial high-speed drive, and gear manufa	0	0.00		0.00	
232	Industrial process furnace and oven manufacturing	0	0.00		0.00	
235	Computer storage device manufacturing	0	0.00		0.00	
241	Electron tube manufacturing	0	0.00		0.00	
254	Analytical laboratory instrument manufacturing	0	0.00		0.00	
255	Irradiation apparatus manufacturing	0	0.00		0.00	
258	Magnetic and optical recording media manufacturing	0	0.00		0.00	
259	Electric lamp bulb and part manufacturing	0	0.00		0.00	
265	Other major household appliance manufacturing	0	0.00		0.00	
271	Primary battery manufacturing	0	0.00		0.00	
277	Light truck and utility vehicle manufacturing	0	0.00		0.00	
281	Motor home manufacturing	0	0.00		0.00	
287	Guided missile and space vehicle manufacturing	0	0.01		0.01	
288	Propulsion units and parts for space vehicles and guided mis:	0	0.00		0.00	
293	Military armored vehicle, tank, and tank component manufact	0	0.00		0.00	
304	Blind and shade manufacturing	0	0.00		0.00	
361	Imputed rental activity for owner-occupied dwellings	0	0.00		451.84	
428	Federal electric utilities	0	0.00		0.00	



**Table 1a. (Continued)**

Sector ID	Aggregate Agriculture Contribution to:	Aggregate Agriculture Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
433	*** Not an industry (Used and secondhand goods)	0	0.00	0.00
434	*** Not an industry (Scrap)	0	0.00	0.00
435	*** Not an industry (Rest of the world adjustment)	0	0.00	0.00
436	*** Not an industry (Noncomparable foreign imports)	0	0.00	0.00
437	Employment and payroll of State and Local Govt, Non-Educa	0	0.00	0.00
438	Employment and payroll of State and Local Govt, Education	0	0.00	0.00
439	Employment and payroll of Federal Govt, Non-Military	0	0.00	0.00
440	Employment and payroll of Federal Govt, Military	0	0.00	0.00
<b>Total</b>		<b>268,617</b>	<b>9,157.020</b>	<b>15,185.803</b>

Note: Sorted by total number of jobs descending

**Table 1b. Agriculture-Generated Activity by Sector, 2006, Revised**

Sector ID	Aggregate Agriculture Contribution to:	Aggregate Agriculture Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
70	Poultry processing	31,872	1,001.672	1,079.103
2	Grain farming	16,482	141.220	375.761
390	Wholesale trade	12,579	710.948	1,265.729
12	Poultry and egg production	11,188	385.071	1,180.787
18	Agriculture and forestry support activities	10,678	283.045	252.687
1	Oilseed farming	8,890	120.144	327.943
481	Food services and drinking places	8,664	116.532	165.434
13	Animal production- except cattle and poultry and e	7,161	16.644	23.773
11	Cattle ranching and farming	6,985	24.080	57.345
394	Truck transportation	6,923	289.485	380.342
112	Sawmills	6,258	255.782	465.052
60	Frozen food manufacturing	5,363	210.828	376.391
14	Logging	5,144	174.266	280.000
431	Real estate	5,089	91.325	386.345
125	Paper and paperboard mills	4,490	424.129	843.947
8	Cotton farming	4,224	107.590	262.565
451	Management of companies and enterprises	4,006	331.442	427.120
465	Offices of physicians- dentists- and other health	3,378	211.743	248.923
126	Paperboard container manufacturing	3,252	183.900	215.739
467	Hospitals	3,149	137.486	151.428
454	Employment services	2,962	47.526	47.153
115	Veneer and plywood manufacturing	2,493	102.713	120.084
400	Warehousing and storage	2,419	84.635	103.871
410	General merchandise stores	2,387	52.310	73.658
73	Bread and bakery product- except frozen- manufactu	2,384	95.901	155.888
479	Hotels and motels- including casino hotels	2,227	38.865	68.642
468	Nursing and residential care facilities	2,069	51.965	54.330
430	Monetary authorities and depository credit interme	2,037	85.922	252.274
494	Private households	1,977	15.758	13.610
130	Coated and uncoated paper bag manufacturing	1,923	100.107	134.202
405	Food and beverage stores	1,912	39.224	56.103
119	Other millwork- including flooring	1,858	61.800	68.744
493	Civic- social- professional and similar organizati	1,857	42.349	33.015
470	Social assistance- except child day care services	1,847	32.433	31.864
401	Motor vehicle and parts dealers	1,822	77.023	109.375
483	Automotive repair and maintenance- except car wash	1,686	40.500	52.960
49	Rice milling	1,630	68.788	103.929
134	Sanitary paper product manufacturing	1,584	108.659	241.814
61	Fruit and vegetable canning and drying	1,561	78.854	161.022
362	Wood kitchen cabinet and countertop manufacturing	1,428	52.360	70.809
411	Miscellaneous store retailers	1,398	19.230	26.717
43	Maintenance and repair of nonresidential buildings	1,316	42.424	45.996
449	Veterinary services	1,282	29.471	27.788
437	Legal services	1,251	58.255	73.163
120	Wood container and pallet manufacturing	1,210	31.994	40.516
404	Building material and garden supply stores	1,179	34.834	56.003
392	Rail transportation	1,163	98.714	172.467
10	All other crop farming	1,153	45.035	111.231

**Table 1b. (Continued)**

Sector ID	Aggregate Agriculture Contribution to:	Aggregate Agriculture Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
438	Accounting and bookkeeping services	1,109	40.108	42.763
412	Nonstore retailers	1,088	9.194	32.920
499	Other State and local government enterprises	1,088	47.329	82.101
47	Other animal food manufacturing	1,084	57.459	69.357
426	Securities- commodity contracts- investments	1,072	46.827	41.309
458	Services to buildings and dwellings	1,071	17.654	21.909
67	Animal- except poultry- slaughtering	1,067	36.393	48.610
68	Meat processed from carcasses	1,053	40.836	55.003
30	Power generation and supply	1,032	93.165	346.717
408	Clothing and clothing accessories stores	1,018	15.119	30.714
85	Soft drink and ice manufacturing	1,012	64.715	104.002
106	Other apparel knitting mills	1,009	25.829	42.700
469	Child day care services	996	13.596	22.014
363	Upholstered household furniture manufacturing	973	39.456	45.021
107	Cut and sew apparel manufacturing	938	22.763	31.634
102	Tire cord and tire fabric mills	923	52.492	74.232
407	Gasoline stations	882	17.557	38.714
406	Health and personal care stores	872	24.145	33.187
118	Cut stock- resawing lumber- and planing	863	26.561	32.012
439	Architectural and engineering services	857	42.494	42.710
444	Management consulting services	823	40.990	42.061
427	Insurance carriers	771	39.654	59.407
425	Nondepository credit intermediation and related a	752	38.500	58.779
364	Nonupholstered wood household furniture manufactur	748	29.160	44.238
75	Mixes and dough made from purchased flour	736	33.133	67.905
455	Business support services	729	13.298	16.992
399	Couriers and messengers	715	20.589	29.339
485	Commercial machinery repair and maintenance	667	19.665	31.737
6	Greenhouse and nursery production	663	21.740	41.713
78	Roasted nuts and peanut butter manufacturing	656	30.270	64.463
409	Sporting goods- hobby- book and music stores	633	8.655	12.861
397	Scenic and sightseeing transportation and support	631	44.461	50.270
79	Other snack food manufacturing	627	34.148	104.462
461	Elementary and secondary schools	621	10.228	10.212
466	Other ambulatory health care services	620	26.032	35.969
398	Postal service	615	29.144	30.451
462	Colleges- universities- and junior colleges	614	14.696	15.024
172	Plastics packaging materials- film and sheet	591	30.575	60.099
114	Reconstituted wood product manufacturing	589	34.190	124.463
450	All other miscellaneous professional and technical	576	11.526	53.543
15	Forest nurseries- forest products- and timber trac	555	24.543	67.479
19	Oil and gas extraction	548	59.452	149.326
113	Wood preservation	535	21.952	30.025
478	Other amusement- gambling- and recreation industri	527	8.504	15.125
177	Plastics plumbing fixtures and all other plastics	519	18.672	30.871
422	Telecommunications	518	49.253	119.899
446	Scientific research and development services	506	25.315	22.182
116	Engineered wood member and truss manufacturing	505	19.245	36.453

**Table 1b. (Continued)**

Sector ID	Aggregate Agriculture Contribution to:	Aggregate Agriculture Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
476	Fitness and recreational sports centers	504	6.940	7.697
487	Personal care services	498	6.675	9.624
402	Furniture and home furnishings stores	489	14.432	24.993
489	Drycleaning and laundry services	478	8.137	9.370
457	Investigation and security services	476	10.186	11.403
52	Soybean processing	434	22.174	31.580
472	Spectator sports	432	5.403	6.822
69	Rendering and meat byproduct processing	420	19.127	47.449
62	Fluid milk manufacturing	417	20.536	25.750
464	Home health care services	406	12.568	14.536
463	Other educational services	365	7.910	10.927
5	Fruit farming	356	3.327	5.913
492	Grantmaking and giving and social advocacy organiz	356	8.969	4.590
403	Electronics and appliance stores	349	8.894	11.241
108	Accessories and other apparel manufacturing	342	9.061	10.886
460	Waste management and remediation services	337	13.056	22.081
447	Advertising and related services	334	14.108	15.482
17	Hunting and trapping	331	0.445	1.883
45	Other maintenance and repair construction	327	10.853	10.024
95	Nonwoven fabric mills	327	21.758	32.064
428	Insurance agencies- brokerages- and related	312	13.102	25.987
46	Dog and cat food manufacturing	308	11.388	23.904
123	Miscellaneous wood product manufacturing	307	7.969	15.094
413	Newspaper publishers	305	14.009	18.611
117	Wood windows and door manufacturing	287	10.238	17.741
442	Computer systems design services	275	19.942	19.291
139	Commercial printing	262	12.115	14.291
31	Natural gas distribution	256	20.622	48.106
3	Vegetable and melon farming	244	11.196	22.242
496	Other Federal Government enterprises	241	4.463	3.318
452	Office administrative services	232	10.698	18.107
81	Flavoring syrup and concentrate manufacturing	225	7.514	21.905
486	Household goods repair and maintenance	216	4.642	13.796
66	Ice cream and frozen dessert manufacturing	214	10.161	21.234
459	Other support services	210	5.873	10.748
432	Automotive equipment rental and leasing	204	6.028	11.477
420	Radio and television broadcasting	198	11.420	11.494
471	Performing arts companies	190	2.032	1.907
173	Plastics pipe- fittings- and profile shapes	190	9.340	18.266
488	Death care services	183	4.095	4.749
482	Car washes	179	2.131	3.856
54	Fats and oils refining and blending	175	7.019	13.728
474	Promoters of performing arts and sports and agents	173	2.997	5.911
435	General and consumer goods rental except video tap	169	4.834	4.906
88	Distilleries	167	16.876	97.398
484	Electronic equipment repair and maintenance	163	4.972	7.895
395	Transit and ground passenger transportation	163	2.423	3.335
131	Die-cut paper office supplies manufacturing	162	5.051	5.605

Table 1b. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
84	All other food manufacturing	162	4.434	5.484
103	Other miscellaneous textile product mills	158	3.440	3.894
490	Other personal services	155	3.074	9.789
101	Textile bag and canvas mills	153	5.913	6.827
110	Footwear manufacturing	144	5.533	5.320
418	Motion picture and video industries	141	4.384	4.940
16	Fishing	134	0.804	0.589
72	Frozen cakes and other pastries manufacturing	132	4.069	4.832
59	Nonchocolate confectionery manufacturing	130	3.339	7.497
434	Machinery and equipment rental and leasing	130	5.800	13.653
491	Religious organizations	129	2.567	7.863
433	Video tape and disc rental	128	1.308	1.851
189	Glass container manufacturing	119	5.311	9.751
312	All other electronic component manufacturing	115	5.057	5.121
416	Database- directory- and other publishers	114	6.099	16.226
135	All other converted paper product manufacturing	113	5.627	9.177
498	State and local government electric utilities	108	8.181	21.397
171	Other miscellaneous chemical product manufacturing	103	7.242	9.076
429	Funds- trusts- and other financial vehicles	102	0.848	0.842
32	Water- sewage and other systems	102	3.861	7.179
240	Metal can- box- and other container manufacturing	101	4.836	7.442
71	Seafood product preparation and packaging	98	1.855	1.884
445	Environmental and other technical consulting servi	98	4.650	6.084
178	Foam product manufacturing	95	4.255	7.831
424	Data processing services	93	8.987	12.417
243	Machine shops	90	3.824	4.354
122	Prefabricated wood building manufacturing	90	2.887	3.764
440	Specialized design services	89	2.941	3.653
391	Air transportation	87	4.139	4.845
64	Cheese manufacturing	87	3.474	4.395
53	Other oilseed processing	86	3.515	8.264
150	Other basic inorganic chemical manufacturing	82	7.632	11.823
456	Travel arrangement and reservation services	78	1.978	2.908
396	Pipeline transportation	78	9.007	16.231
309	Audio and video equipment manufacturing	76	2.999	3.159
443	Other computer related services- including facilit	75	5.875	12.277
159	Pesticide and other agricultural chemical manufact	75	5.347	25.904
48	Flour milling	74	4.045	6.698
142	Petroleum refineries	74	8.092	19.028
257	Farm machinery and equipment manufacturing	73	2.651	5.081
151	Other basic organic chemical manufacturing	70	6.898	10.832
369	Custom architectural woodwork and millwork	64	2.313	3.150
97	Textile and fabric finishing mills	64	1.684	1.902
42	Maintenance and repair of farm and nonfarm residen	62	1.996	2.071
480	Other accommodations	59	1.127	2.059
74	Cookie and cracker manufacturing	58	2.962	7.260
477	Bowling centers	57	0.783	1.324
368	Wood office furniture manufacturing	57	1.755	4.181

**Table 1b. (Continued)**

<b>Sector ID</b>	<b>Aggregate Agriculture Contribution to:</b>	<b>Employment (Jobs)</b>	<b>Income (Million \$)</b>	<b>Value Added (\$ Million)</b>
175	Plastics bottle manufacturing	57	2.903	6.458
167	Printing ink manufacturing	56	3.747	4.870
448	Photographic services	55	1.008	1.433
497	State and local government passenger transit	54	2.739	1.225
473	Independent artists- writers- and performers	53	1.085	1.256
87	Wineries	52	3.540	5.630
174	Laminated plastics plate- sheet- and shapes	46	1.886	3.176
294	Industrial truck- trailer- and stacker manufacturi	44	1.961	2.338
83	Spice and extract manufacturing	39	0.690	1.539
350	Motor vehicle parts manufacturing	38	1.860	2.187
51	Wet corn milling	37	2.385	5.043
375	Surgical and medical instrument manufacturing	36	1.892	2.883
77	Tortilla manufacturing	36	1.030	1.605
379	Dental laboratories	36	1.780	1.828
86	Breweries	34	2.995	10.664
166	Toilet preparation manufacturing	33	2.351	7.732
4	Tree nut farming	32	0.896	1.804
414	Periodical publishers	31	1.846	2.812
378	Ophthalmic goods manufacturing	29	1.043	1.804
149	Synthetic dye and pigment manufacturing	28	2.044	3.107
100	Curtain and linen mills	27	0.602	1.004
371	Showcases- partitions- shelving- and lockers	26	1.281	2.331
258	Lawn and garden equipment manufacturing	23	0.614	1.156
158	Fertilizer- mixing only- manufacturing	22	1.194	1.835
229	Hand and edge tool manufacturing	22	1.009	1.680
181	Other rubber product manufacturing	22	0.987	1.646
28	Support activities for oil and gas operations	21	1.260	3.480
393	Water transportation	21	1.206	2.329
384	Sign manufacturing	21	0.917	0.958
283	Cutting tool and machine tool accessory manufactur	21	1.124	1.280
190	Glass and glass products- except glass containers	21	0.911	1.677
282	Special tool- die- jig- and fixture manufacturing	20	0.889	0.935
436	Lessors of nonfinancial intangible assets	19	1.855	17.835
98	Fabric coating mills	19	0.969	1.715
311	Semiconductors and related device manufacturing	19	0.985	1.101
247	Electroplating- anodizing- and coloring metal	19	0.771	1.354
156	Nitrogenous fertilizer manufacturing	18	1.614	4.089
423	Information services	18	1.330	1.887
382	Doll- toy- and game manufacturing	18	1.120	1.722
111	Other leather product manufacturing	17	1.066	1.291
264	Paper industry machinery manufacturing	16	1.156	1.197
145	Petroleum lubricating oil and grease manufacturing	16	1.002	1.084
55	Breakfast cereal manufacturing	16	0.855	1.258
475	Museums- historical sites- zoos- and parks	15	3.740	3.226
333	Electric power and specialty transformer manufactu	13	0.669	0.907
246	Metal coating and nonprecious engraving	13	0.441	0.655
144	Asphalt shingle and coating materials manufacturin	13	1.333	1.779
323	Audio and video media reproduction	13	0.639	0.674

**Table 1b. (Continued)**

Sector ID	Aggregate Agriculture Contribution to:	Aggregate Agriculture Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
334	Motor and generator manufacturing	13	0.732	1.218
160	Pharmaceutical and medicine manufacturing	12	0.714	1.387
58	Confectionery manufacturing from purchased chocola	12	0.224	0.545
372	Mattress manufacturing	12	0.410	0.872
453	Facilities support services	10	0.309	0.357
208	Alumina refining	10	0.787	1.408
441	Custom computer programming services	10	0.609	0.556
248	Metal valve manufacturing	9	0.516	0.977
169	Custom compounding of purchased resins	9	0.269	0.371
377	Dental equipment and supplies manufacturing	8	0.388	0.509
417	Software publishers	8	0.814	1.487
346	Motor vehicle body manufacturing	8	0.463	0.274
344	Automobile and light truck manufacturing	8	0.710	1.051
376	Surgical appliance and supplies manufacturing	8	0.557	0.893
20	Coal mining	8	0.888	1.640
76	Dry pasta manufacturing	8	0.337	0.822
386	Musical instrument manufacturing	7	0.309	0.278
349	Travel trailer and camper manufacturing	7	0.268	0.279
295	Power-driven handtool manufacturing	7	0.275	0.481
180	Rubber and plastics hose and belting manufacturing	7	0.328	0.578
292	Conveyor and conveying equipment manufacturing	7	0.291	0.455
301	Scales- balances- and miscellaneous general purpos	7	0.282	0.393
25	Sand- gravel- clay- and refractory mining	7	0.326	0.512
198	Abrasive product manufacturing	7	0.164	0.340
65	Dry- condensed- and evaporated dairy products	7	0.358	1.000
136	Manifold business forms printing	7	0.305	0.509
242	Spring and wire product manufacturing	7	0.234	0.373
26	Other nonmetallic mineral mining	6	0.360	0.546
262	Sawmill and woodworking machinery	6	0.322	0.347
99	Carpet and rug mills	6	0.099	0.241
345	Heavy duty truck manufacturing	6	0.353	0.533
244	Turned product and screw- nut- and bolt manufactur	6	0.248	0.379
163	Soap and other detergent manufacturing	6	0.553	1.469
389	Buttons- pins- and all other miscellaneous manufac	6	0.212	0.233
415	Book publishers	5	0.414	0.674
235	Metal window and door manufacturing	5	0.246	0.351
337	Storage battery manufacturing	5	0.351	0.445
341	Wiring device manufacturing	5	0.220	0.469
316	Industrial process variable instruments	5	0.202	0.205
250	Small arms manufacturing	5	0.180	0.259
164	Polish and other sanitation good manufacturing	5	0.242	0.785
421	Cable networks and program distribution	4	0.156	1.031
286	Other engine equipment manufacturing	4	0.109	0.216
228	Cutlery and flatware- except precious- manufacturi	4	0.125	0.240
317	Totalizing fluid meters and counting devices	4	0.140	0.147
211	Aluminum sheet- plate- and foil manufacturing	4	0.290	0.478
330	Household refrigerator and home freezer manufactur	4	0.174	0.266
273	Other commercial and service industry machinery ma	4	0.196	0.212

**Table 1b. (Continued)**

<b>Sector ID</b>	<b>Aggregate Agriculture Contribution to:</b>	<b>Employment (Jobs)</b>	<b>Income (Million \$)</b>	<b>Value Added (\$ Million)</b>
152	Plastics material and resin manufacturing	4	0.315	0.655
252	Fabricated pipe and pipe fitting manufacturing	4	0.158	0.249
340	Other communication and energy wire manufacturing	4	0.269	0.541
419	Sound recording industries	4	0.200	1.009
256	Ammunition manufacturing	3	0.182	0.230
245	Metal heat treating	3	0.151	0.245
297	Packaging machinery manufacturing	3	0.126	0.155
269	All other industrial machinery manufacturing	3	0.183	0.203
263	Plastics and rubber industry machinery	3	0.173	0.237
227	All other forging and stamping	3	0.128	0.188
274	Automatic vending- commercial laundry and dryclean	3	0.113	0.140
327	Electric housewares and household fan manufacturin	3	0.132	0.252
186	Ceramic wall and floor tile manufacturing	3	0.129	0.208
93	Broadwoven fabric mills	3	0.131	0.155
141	Prepress services	3	0.097	0.159
351	Aircraft manufacturing	3	0.188	0.197
24	Stone mining and quarrying	3	0.167	0.283
381	Sporting and athletic goods manufacturing	3	0.129	0.152
199	Cut stone and stone product manufacturing	3	0.074	0.078
385	Gasket- packing- and sealing device manufacturing	2	0.125	0.139
328	Household vacuum cleaner manufacturing	2	0.094	0.200
82	Mayonnaise- dressing- and sauce manufacturing	2	0.024	0.042
203	Iron and steel mills	2	0.283	0.595
331	Household laundry equipment manufacturing	2	0.185	0.285
80	Coffee and tea manufacturing	2	0.023	0.025
335	Switchgear and switchboard apparatus manufacturing	2	0.124	0.230
148	Industrial gas manufacturing	2	0.160	0.511
143	Asphalt paving mixture and block manufacturing	2	0.130	0.137
205	Iron- steel pipe and tube from purchased steel	2	0.118	0.276
236	Sheet metal work manufacturing	2	0.099	0.161
137	Books printing	2	0.080	0.267
365	Metal household furniture manufacturing	2	0.095	0.212
207	Steel wire drawing	2	0.086	0.229
57	Confectionery manufacturing from cacao beans	2	0.030	0.066
233	Fabricated structural metal manufacturing	2	0.086	0.148
23	Gold- silver- and other metal ore mining	2	0.211	0.438
232	Prefabricated metal buildings and components	2	0.072	0.085
271	Optical instrument and lens manufacturing	2	0.067	0.074
241	Hardware manufacturing	2	0.056	0.100
367	Other household and institutional furniture	2	0.053	0.086
342	Carbon and graphite product manufacturing	1	0.071	0.163
374	Laboratory apparatus and furniture manufacturing	1	0.062	0.070
265	Textile machinery manufacturing	1	0.082	0.102
366	Institutional furniture manufacturing	1	0.067	0.105
234	Plate work manufacturing	1	0.066	0.131
336	Relay and industrial control manufacturing	1	0.057	0.065
306	Telephone apparatus manufacturing	1	0.094	0.104
343	Miscellaneous electrical equipment manufacturing	1	0.068	0.080

Table 1b. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
356	Railroad rolling stock manufacturing	1	0.045	0.051
129	Coated and laminated paper and packaging materials	1	0.046	0.075
358	Boat building	1	0.044	0.058
133	Stationery and related product manufacturing	1	0.028	0.037
387	Broom- brush- and mop manufacturing	1	0.045	0.067
147	Petrochemical manufacturing	1	0.034	0.202
287	Speed changers and mechanical power transmission e	1	0.020	0.026
313	Electromedical apparatus manufacturing	1	0.045	0.047
183	Vitreous china and earthenware articles manufactur	1	0.014	0.017
352	Aircraft engine and engine parts manufacturing	1	0.053	0.074
237	Ornamental and architectural metal work manufactur	1	0.023	0.035
27	Drilling oil and gas wells	1	0.050	0.143
314	Search- detection- and navigation instruments	1	0.035	0.035
92	Fiber- yarn- and thread mills	1	0.024	0.029
140	Tradebinding and related work	1	0.022	0.034
267	Food product machinery manufacturing	1	0.047	0.058
138	Blankbook and looseleaf binder manufacturing	1	0.023	0.049
380	Jewelry and silverware manufacturing	1	0.037	0.043
162	Adhesive manufacturing	1	0.031	0.046
308	Other communications equipment manufacturing	1	0.017	0.018
168	Explosives manufacturing	1	0.030	0.038
353	Other aircraft parts and equipment	1	0.025	0.029
305	Other computer peripheral equipment manufacturing	0	0.036	0.037
354	Guided missile and space vehicle manufacturing	0	0.035	0.041
217	Copper wire- except mechanical- drawing	0	0.025	0.048
383	Office supplies- except paper- manufacturing	0	0.023	0.035
259	Construction machinery manufacturing	0	0.020	0.037
127	Flexible packaging foil manufacturing	0	0.017	0.021
192	Ready-mix concrete manufacturing	0	0.016	0.025
307	Broadcast and wireless communications equipment	0	0.016	0.017
321	Watch- clock- and other measuring and controlling	0	0.016	0.016
284	Rolling mill and other metalworking machinery	0	0.019	0.023
213	Other aluminum rolling and drawing	0	0.019	0.040
281	Metal forming machine tool manufacturing	0	0.017	0.021
212	Aluminum extruded product manufacturing	0	0.017	0.023
279	Industrial mold manufacturing	0	0.017	0.019
261	Oil and gas field machinery and equipment	0	0.015	0.018
347	Truck trailer manufacturing	0	0.014	0.015
153	Synthetic rubber manufacturing	0	0.024	0.053
161	Paint and coating manufacturing	0	0.017	0.030
266	Printing machinery and equipment manufacturing	0	0.017	0.018
146	All other petroleum and coal products manufacturin	0	0.012	0.019
289	Air and gas compressor manufacturing	0	0.011	0.019
260	Mining machinery and equipment manufacturing	0	0.009	0.013
388	Burial casket manufacturing	0	0.008	0.014
170	Photographic film and chemical manufacturing	0	0.007	0.013
195	Other concrete product manufacturing	0	0.006	0.009
361	All other transportation equipment manufacturing	0	0.006	0.011



**Table 1b. (Continued)**

<b>Sector ID</b>	<b>Aggregate Agriculture Contribution to:</b>	<b>Employment (Jobs)</b>	<b>Income (Million \$)</b>	<b>Value Added (\$ Million)</b>
291	Elevator and moving stairway manufacturing	0	0.005	0.007
315	Automatic environmental control manufacturing	0	0.004	0.004
302	Electronic computer manufacturing	0	0.019	0.020
222	Aluminum foundries	0	0.009	0.009
255	Miscellaneous fabricated metal product manufacturi	0	0.008	0.012
288	Pump and pumping equipment manufacturing	0	0.008	0.011
224	Iron and steel forging	0	0.007	0.011
196	Lime manufacturing	0	0.006	0.011
299	Fluid power cylinder and actuator manufacturing	0	0.006	0.008
197	Gypsum product manufacturing	0	0.005	0.014
223	Nonferrous foundries- except aluminum	0	0.005	0.006
185	Brick and structural clay tile manufacturing	0	0.005	0.008
239	Metal tank- heavy gauge- manufacturing	0	0.005	0.007
370	Office furniture- except wood- manufacturing	0	0.004	0.010
201	Mineral wool manufacturing	0	0.004	0.008
216	Copper rolling- drawing- and extruding	0	0.004	0.006
275	Air purification equipment manufacturing	0	0.003	0.004
202	Miscellaneous nonmetallic mineral products	0	0.003	0.007
509	Owner-occupied dwellings	0	0.000	673.343
<b>Total</b>		<b>274,150</b>	<b>9,108.774</b>	<b>15,934.384</b>

Note: Sorted by total number of jobs descending

**Table 2a. Crop Contributions by Sector, 2007**

Sector ID	Crops Sector Contribution to:	Crops Sector Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
2	Grain farming	24,298.20	386.323	691.796
1	Oilseed farming	9,176.60	205.023	434.973
53	Frozen food manufacturing	5,387.10	227.746	238.708
8	Cotton farming	3,685.90	95.814	327.774
10	All other crop farming	2,594.60	76.672	108.728
62	Bread and bakery product manufacturing	2,274.90	96.535	107.201
43	Flour milling and malt manufacturing	1,559.50	73.732	99.813
54	Fruit and vegetable canning, pickling, and drying	1,425.80	69.828	132.082
65	Snack food manufacturing	1,270.70	68.467	150.864
85	All other textile product mills	1,089.50	55.426	82.537
70	Soft drink and ice manufacturing	960.6	63.491	66.736
86	Apparel knitting mills	732.8	22.483	26.060
88	Men's and boys' cut and sew apparel manufacturing	545.9	12.531	14.532
63	Cookie, cracker, and pasta manufacturing	512.9	27.523	41.210
6	Greenhouse, nursery, and floriculture production	504.9	20.642	29.266
64	Tortilla manufacturing	329.6	11.686	14.257
91	Apparel accessories and other apparel manufacturing	320.9	8.241	8.077
45	Soybean and other oilseed processing	241.9	11.538	16.018
68	Seasoning and dressing manufacturing	241.6	7.934	8.778
46	Fats and oils refining and blending	225.2	8.839	16.103
4	Fruit farming	184	1.194	0.791
47	Breakfast cereal manufacturing	169.9	8.831	21.671
69	All other food manufacturing	157.7	4.654	5.486
78	Nonwoven fabric mills	152.9	11.272	13.064
3	Vegetable and melon farming	152.8	12.562	14.361
84	Textile bag and canvas mills	140.7	5.532	5.736
73	Distilleries	125.6	11.787	85.049
76	Broadwoven fabric mills	123.8	6.758	6.999
87	Cut and sew apparel contractors	121.4	2.011	2.337
44	Wet corn milling	120.5	7.796	10.451
71	Breweries	109.8	10.688	28.529
80	Textile and fabric finishing mills	68.7	1.750	1.831
72	Wineries	65	4.949	6.653
51	Confectionery manufacturing from purchased chocolate	60.1	1.277	2.283
52	Nonchocolate confectionery manufacturing	46.5	1.475	1.999
50	Chocolate and confectionery manuf. from cacao beans	32.6	0.990	1.246
83	Curtain and linen mills	27.5	0.624	0.770
5	Tree nut farming	17.9	1.057	1.721
66	Coffee and tea manufacturing	14.1	0.520	0.745
81	Fabric coating mills	12.6	0.712	0.741
89	Women's and girls' cut and sew apparel manufacturing	12.1	0.450	0.511
67	Flavoring syrup and concentrate manufacturing	7.8	0.783	5.624
75	Fiber, yarn, and thread mills	7.4	0.319	0.326
82	Carpet and rug mills	3.4	0.057	0.073
7	Tobacco farming	0	0.000	0.000
9	Sugarcane and sugar beet farming	0	0.000	0.000
48	Sugar cane mills and refining	0	0.000	0.000
49	Beet sugar manufacturing	0	0.000	0.000

**Table 2a. (Continued)**

Sector ID	Crops Sector Contribution to:	Crops Sector Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
74	Tobacco product manufacturing	0	0.000	0.000
77	Narrow fabric mills and schiffli machine embroidery	0	0.000	0.000
79	Knit fabric mills	0	0.000	0.000
90	Other cut and sew apparel manufacturing	0	0.000	0.000
<b>Total</b>		<b>59,314</b>	<b>1,648.523</b>	<b>2,834.510</b>

Note: Sorted by total number of jobs descending

**Table 2b. Crop Contributions by Sector, 2006, Revised**

Sector ID	Crops Sector Contribution to:	Crops Sector Contribution to:		
		Employment (Jobs)	Income (Million \$)	Value Added (\$ Million)
2	Grain farming	16,481.70	141.220	375.761
1	Oilseed farming	8,889.80	120.144	327.943
60	Frozen food manufacturing	5,363.40	210.828	376.391
8	Cotton farming	4,223.90	107.590	262.565
73	Bread and bakery product- except frozen- manufactu	2,383.50	95.901	155.888
49	Rice milling	1,630.00	68.788	103.929
61	Fruit and vegetable canning and drying	1,560.70	78.854	161.022
10	All other crop farming	1,152.90	45.035	111.231
85	Soft drink and ice manufacturing	1,012.00	64.715	104.002
106	Other apparel knitting mills	1,009.10	25.829	42.700
107	Cut and sew apparel manufacturing	937.9	22.763	31.634
102	Tire cord and tire fabric mills	923.1	52.492	74.232
75	Mixes and dough made from purchased flour	736.3	33.133	67.905
6	Greenhouse and nursery production	663.4	21.740	41.713
78	Roasted nuts and peanut butter manufacturing	655.6	30.270	64.463
79	Other snack food manufacturing	627.2	34.148	104.462
52	Soybean processing	434.2	22.174	31.580
5	Fruit farming	355.8	3.327	5.913
108	Accessories and other apparel manufacturing	342	9.061	10.886
95	Nonwoven fabric mills	327	21.758	32.064
3	Vegetable and melon farming	243.8	11.196	22.242
81	Flavoring syrup and concentrate manufacturing	224.6	7.514	21.905
54	Fats and oils refining and blending	175.2	7.019	13.728
88	Distilleries	166.8	16.876	97.398
84	All other food manufacturing	161.8	4.434	5.484
103	Other miscellaneous textile product mills	157.7	3.440	3.894
101	Textile bag and canvas mills	153.4	5.913	6.827
72	Frozen cakes and other pastries manufacturing	132.3	4.069	4.832
59	Nonchocolate confectionery manufacturing	129.9	3.339	7.497
53	Other oilseed processing	86.4	3.515	8.264
48	Flour milling	73.6	4.045	6.698
97	Textile and fabric finishing mills	63.7	1.684	1.902
74	Cookie and cracker manufacturing	58.4	2.962	7.260
87	Wineries	51.5	3.540	5.630
83	Spice and extract manufacturing	39	0.690	1.539
51	Wet corn milling	37	2.385	5.043
77	Tortilla manufacturing	35.9	1.030	1.605
86	Breweries	33.7	2.995	10.664
4	Tree nut farming	32	0.896	1.804
100	Curtain and linen mills	26.7	0.602	1.004
98	Fabric coating mills	19.1	0.969	1.715
55	Breakfast cereal manufacturing	15.6	0.855	1.258
58	Confectionery manufacturing from purchased chocola	11.9	0.224	0.545
76	Dry pasta manufacturing	7.5	0.337	0.822
99	Carpet and rug mills	6.1	0.099	0.241
93	Broadwoven fabric mills	2.9	0.131	0.155
82	Mayonnaise- dressing- and sauce manufacturing	2.4	0.024	0.042
80	Coffee and tea manufacturing	2.3	0.023	0.025

**Table 2b. (Continued)**

<b>Sector ID</b>	<b>Crops Sector Contribution to:</b>	<b>Employment (Jobs)</b>	<b>Income (Million \$)</b>	<b>Value Added (\$ Million)</b>
57	Confectionery manufacturing from cacao beans	1.6	0.030	0.066
92	Fiber- yarn- and thread mills	0.7	0.024	0.029
104	Sheer hosiery mills	0	0.000	0.000
7	Tobacco farming	0	0.000	0.000
9	Sugarcane and sugar beet farming	0	0.000	0.000
50	Malt manufacturing	0	0.000	0.000
56	Sugar manufacturing	0	0.000	0.000
89	Tobacco stemming and redrying	0	0.000	0.000
90	Cigarette manufacturing	0	0.000	0.000
91	Other tobacco product manufacturing	0	0.000	0.000
94	Narrow fabric mills and schiffli embroidery	0	0.000	0.000
96	Knit fabric mills	0	0.000	0.000
105	Other hosiery and sock mills	0	0.000	0.000
<b>Total</b>		<b>51,863</b>	<b>1300.628</b>	<b>2726.402</b>

Note: Sorted by total number of jobs descending

**Table 3a. Animal Agriculture Contributions by Sector, 2007**

<b>Sector ID</b>	<b>Animal Agriculture Sector Contribution to:</b>	<b>Employment (Jobs)</b>	<b>Income (Million \$)</b>	<b>Value Added (\$ Million)</b>
60	Poultry processing	30,226	991.055	1,040.453
13	Poultry and egg production	10,481	302.497	649.505
14	Animal prod., except cattle and poultry and eggs	5,358	24.099	124.228
11	Cattle ranching and farming	4,539	22.504	96.925
59	Animal (except poultry) processing	2,549	107.243	113.944
93	Footwear manufacturing	1,663	46.375	48.911
42	Other animal food manufacturing	1,071	64.804	89.089
41	Dog and cat food manufacturing	372	14.732	37.223
12	Dairy cattle and milk production	339	1.406	17.520
55	Fluid milk and butter manufacturing	252	12.608	17.226
94	Other leather and allied product manufacturing	209	7.741	8.984
56	Cheese manufacturing	192	8.106	9.513
58	Ice cream and frozen dessert manufacturing	186	9.483	14.493
61	Seafood product preparation and packaging	86	1.679	1.785
57	Dry, condensed, and evaporated dairy manuf.	83	4.962	6.817
92	Leather and hide tanning and finishing	6	0.221	0.220
<b>Total</b>		<b>57,610</b>	<b>1,619.514</b>	<b>2,276.835</b>

Note: Sorted by total number of jobs descending

**Table 3b. Animal Agriculture Contributions by Sector, 2006, Revised**

<b>Sector ID</b>	<b>Animal Agriculture Sector Contribution to:</b>	<b>Employment (Jobs)</b>	<b>Income (Million \$)</b>	<b>Value Added (\$ Million)</b>
70	Poultry processing	31,872	1,001.672	1,079.103
12	Poultry and egg production	11,188	385.071	1,180.787
13	Animal production- except cattle, poultry & eggs	7,161	16.644	23.773
11	Cattle ranching and farming	6,985	24.080	57.345
47	Other animal food manufacturing	1,084	57.459	69.357
67	Animal- except poultry- slaughtering	1,067	36.393	48.610
68	Meat processed from carcasses	1,053	40.836	55.003
69	Rendering and meat byproduct processing	420	19.127	47.449
62	Fluid milk manufacturing	417	20.536	25.750
46	Dog and cat food manufacturing	308	11.388	23.904
66	Ice cream and frozen dessert manufacturing	214	10.161	21.234
71	Seafood product preparation and packaging	98	1.855	1.884
64	Cheese manufacturing	87	3.474	4.395
65	Dry- condensed- and evaporated dairy products	7	0.358	1.000
63	Creamery butter manufacturing	0	0.000	0.000
<b>Total</b>		<b>61,960</b>	<b>1,629.053</b>	<b>2,639.594</b>

Note: Sorted by total number of jobs descending

**Table 4a. Forestry Contributions by Sector, 2007**

<b>Sector ID</b>	<b>Forestry Sector Contribution to:</b>	<b>Employment (Jobs)</b>	<b>Income (Million \$)</b>	<b>Value Added (\$ Million)</b>
95	Sawmills and wood preservation	5,586	232.067	344.467
16	Commercial logging	5,508	192.502	635.293
107	Paperboard container manufacturing	3,024	174.839	177.500
105	Paper mills	2,785	265.065	420.963
99	Wood windows and doors and millwork manuf.	2,765	94.827	132.485
96	Veneer and plywood manufacturing	2,128	98.655	137.044
109	All other paper bag and coated and treated paper manuf.	1,650	79.158	83.985
111	Sanitary paper product manufacturing	1,625	104.481	210.899
106	Paperboard Mills	1,378	108.651	160.155
295	Wood kitchen cabinet and countertop manufacturing	1,281	41.067	41.540
100	Wood container and pallet manufacturing	1,141	30.871	41.203
296	Upholstered household furniture manufacturing	812	27.667	30.483
297	Nonupholstered wood household furniture manufacturing	677	21.896	27.127
97	Engineered wood member and truss manufacturing	668	24.228	37.219
15	Forestry, forest products, and timber tract production	652	31.757	208.983
98	Reconstituted wood product manufacturing	600	35.137	90.084
108	Coated and laminated paper manf.	267	16.236	20.275
103	All other miscellaneous wood product manufacturing	261	7.231	11.243
301	Office furniture and cust. arch. woodwork manuf.	199	6.802	7.207
110	Stationery product manufacturing	156	5.457	5.875
101	Manufactured home (mobile home) manufacturing	55	1.822	1.967
102	Prefabricated wood building manufacturing	25	0.871	1.182
300	Wood television, radio, and sewing machine cabinet manuf.	15	0.479	0.734
104	Pulp mills	0	0.000	0.000
112	All other converted paper product manufacturing	0	0.000	0.000
<b>Total</b>		<b>33,259</b>	<b>1,601.767</b>	<b>2,827.914</b>

Note: Sorted by total number of jobs descending

**Table 4b. Forestry Contributions by Sector, 2006, Revised**

<b>Sector ID</b>	<b>Forestry Sector Contribution to:</b>	<b>Employment (Jobs)</b>	<b>Income (Million \$)</b>	<b>Value Added (\$ Million)</b>
112	Sawmills	6,258	255.782	465.052
14	Logging	5,144	174.266	280.000
125	Paper and paperboard mills	4,490	424.129	843.947
126	Paperboard container manufacturing	3,252	183.900	215.739
115	Veneer and plywood manufacturing	2,493	102.713	120.084
130	Coated and uncoated paper bag manufacturing	1,923	100.107	134.202
119	Other millwork- including flooring	1,858	61.800	68.744
134	Sanitary paper product manufacturing	1,584	108.659	241.814
362	Wood kitchen cabinet and countertop manufacturin	1,428	52.360	70.809
120	Wood container and pallet manufacturing	1,210	31.994	40.516
363	Upholstered household furniture manufacturing	973	39.456	45.021
118	Cut stock- resawing lumber- and planing	863	26.561	32.012
364	Nonupholstered wood household furniture manufac	748	29.160	44.238
114	Reconstituted wood product manufacturing	589	34.190	124.463
15	Forest nurseries- forest products- and timber trac	555	24.543	67.479
113	Wood preservation	535	21.952	30.025
116	Engineered wood member and truss manufacturing	505	19.245	36.453
123	Miscellaneous wood product manufacturing	307	7.969	15.094
117	Wood windows and door manufacturing	287	10.238	17.741
131	Die-cut paper office supplies manufacturing	162	5.051	5.605
135	All other converted paper product manufacturing	113	5.627	9.177
122	Prefabricated wood building manufacturing	90	2.887	3.764
369	Custom architectural woodwork and millwork	64	2.313	3.150
368	Wood office furniture manufacturing	57	1.755	4.181
129	Coated and laminated paper and packaging material	1	0.046	0.075
133	Stationery and related product manufacturing	1	0.028	0.037
124	Pulp mills	0	0.000	0.000
128	Surface-coated paperboard manufactuing	0	0.000	0.000
132	Envelope manufacturing	0	0.000	0.000
<b>Total</b>		<b>35,490</b>	<b>1,726.730</b>	<b>2,919.422</b>

Note: Sorted by total number of jobs descending





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