

# Iowa's Major Final Demand Satisfying Industries

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## Findings Overview

This study compares two methods for quantifying the economic contributions of industries in Iowa. The first method is called the direct approach. The direct approach measures the jobs and the payments to labor, investors, and others that are required to support an industry's operations over the course of a year.

The second method is the "final demand" approach. Final demand refers to the sales of goods and services that are consumed either by households or institutions within the state, plus sales of all goods and services that leave the state as exports. The final demand approach traces the entire, in-state industrial and labor supply chain required to make a final demand sale.

The advantage of the final demand approach is that it allows industries to measure and claim true economic impacts, which can only occur when the Iowa economy grows (or declines) as a result of changes in final demand. It allows important sectors like agriculture and manufacturing to declare the fraction of the total economy that they explain.

Another advantage of the final demand approach is that it helps us distinguish industries that are primarily producing for final demand from other, supporting industries that primarily supply inputs to those sellers to final demand. For example, while much of Iowa corn may be sold to export, a final demand sale, much is also converted into feed grains, high fructose corn sweeteners and ethanol by Iowa manufacturers. Those farm sales to manufacturers are called intermediate sales. Similarly, Iowa has export sales of farm chemicals and fertilizers, a final demand transaction, but those same products are inputs into agriculture and constitute part of their supply chain as they sell to both export buyers and to manufacturers. The final demand method sorts out these relationships and attributes all of the economic activity to the final demand-satisfying industry.

The report looks at

1. Agriculture, ag product manufacturing, plus other ag-related manufacturing.
2. Separately, all manufacturing.
3. Other industries and institutions demonstrating prominence in Iowa's economy under the final demand method, including construction, mining, utilities, governmental institutions, and households.

Some findings for the major categories:

- Agriculture plus all ag product manufacturing (food and related plus ethanol)
  - Directly explain 8.1 percent and 8.7 percent, respectively, of Iowa jobs and value added (also known as gross domestic product).
  - Under the final demand method, these fractions grow to 17.1 and 17.4 percent, respectively.
- When other ag-related industries are added (machinery, fertilizers, and chemicals), the job and value added sales are
  - 8.8 percent and 10.3 percent, respectively, when measured directly.
  - When measured using the final demand method, they grow to 18.8 percent and 19.9 percent, respectively.
- Looking at all manufacturing (including those manufacturers above that were included in the ag sector analysis)
  - Direct manufacturing jobs are 11.1 percent, and value added is 17.6 percent of Iowa totals.
  - Using the final demand calculation that considers the entire supply chain and household spending associated with manufacturing final demand sales, those values grow to 28.1 percent of all jobs and 32.8 percent of value added.
- On a final demand basis, agriculture plus all manufacturing explain 38 percent of the state's value added (GDP), 36.3 percent of its labor income, and 33.5 percent of all jobs statewide.
- Governments and households also account for a substantial fraction of final demand-related economic activity.
  - All governments in Iowa linked to 15.8 percent of all jobs and 14.0 percent of all value added.

- Households in Iowa, via their ability to source incomes from transfers, pensions, and investments, explained 17.4 percent of all jobs and 14.8 percent of all value added.

## Introduction

Iowa's state economy benefits significantly from the domestic and foreign export of agriculture products and manufactured goods. This report uses a form of input-output analysis to estimate the total number of jobs in Iowa that depend on those export-oriented sales. This kind of analysis produces results that are distinguished from the conventional direct reporting of industrial activity, such as the amount of sales or the number of employees in an industry. It instead takes into account all of the linkages an export-oriented sector has with all of its suppliers, and *their* suppliers, and so on and so on.

This analysis reclassifies all economic activity in Iowa into two categories: that which contributes towards satisfying final demand (of which export sales are the largest portion) and that which supports the final demand-oriented industries. Economic activity is thus simplified into basic economic activities (primarily export-oriented) and non-basic activities. In this view, short run economic growth in an economy is driven by export sales or other expansions in final demand sales. Non-basic activities, in turn, are driven by changes in basic sector output.

While any sector can have export or other final demand sales, this report summarizes only those sectors which are substantially dependent on final demand sales. The *ad hoc* criterion for inclusion was if the final demand job count exceeded the direct job count for an industry. The main final demanders in an economy are households, governments, capital, and domestic and foreign export markets. Agriculture and manufacturing are the primary exporting sectors in Iowa as are, to much less degrees, utilities and mining. The construction sector contributes to capital formation, another type of final demand. Government (federal, state, and local) produces sets of final products in the form of public goods that are consumed by Iowans. Finally, households as institutions receive significant incomes from outside the state, including investment and social assistance income, which in turn drive economic activity within the state. Summaries of the final demand economic "impact" of all of these sectors or institutions are provided in the subsequent analysis.<sup>1</sup> Direct and final demand summaries for the remaining Iowa industrial sectors are found in two appendices.

The most conventional measures of any industry sector's size and importance are the value of its production (usually Gross Domestic Product) and its number of jobs. Table 1 shows a count of jobs in the 2018 Iowa economy from the U.S. Bureau of Economic Analysis. As a percentage

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<sup>1</sup> Economic impact in this case attributes external demand as creating positive and negative outcomes in Iowa. Firms with external sales orientations create economic activity in Iowa that would not exist but for the external sales.

of the total, all governments accounted for 13 percent of all jobs, followed in numerical importance by manufacturing, all retail trade, and health care and social assistance. The Iowa ag economy directly employed 4.2 percent of Iowa job holders. This table tells us where people work, but it does not tell us how many jobs depend on agriculture or manufacturing when we consider the complete flow of Iowa goods and services that are purchased by these industries to produce commodities for final demand sales.<sup>2</sup>

**TABLE 1**

**Iowa Employment by Broad Classification and as Percents of Total Employment**

	<b>2018</b>	<b>Total</b>
Total employment (number of jobs)	2,087,993	100.0%
By industry		
Farm employment	87,227	4.2%
Nonfarm employment	2,000,766	95.8%
Private nonfarm employment	1,729,144	82.8%
Forestry, fishing, and related activities	17,149	0.8%
Mining, quarrying, and oil and gas extraction	4,371	0.2%
Utilities	6,725	0.3%
Construction	118,139	5.7%
Manufacturing	230,349	11.0%
Wholesale trade	70,573	3.4%
Retail trade	221,460	10.6%
Transportation and warehousing	87,513	4.2%
Information	27,080	1.3%
Finance and insurance	134,642	6.4%
Real estate and rental and leasing	74,858	3.6%
Professional, scientific, and technical services	82,840	4.0%
Management of companies and enterprises	21,327	1.0%
Administrative and support and waste management and remediation services	88,256	4.2%
Educational services	48,215	2.3%
Health care and social assistance	219,643	10.5%
Arts, entertainment, and recreation	37,625	1.8%
Accommodation and food services	133,164	6.4%
Other services (except government and government enterprises)	105,215	5.0%
Government and government enterprises	271,622	13.0%

Using a final demand approach to evaluating total jobs (and other economic variables) associated with industrial production provides a different accounting of sectoral importance to the Iowa economy. Iowa agriculture, for example, stimulates substantial manufactured inputs, requires transportation, utilizes ag-specific and other general business services, and buys large volumes from ag-oriented wholesalers. These linked activities increase the ag sector's final

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<sup>2</sup> Fastidious readers might notice that the sum of jobs in Table 1, a table from the U.S. BEA, is slightly different than the state total found in the appendices, tables derived from the modeling system used for this study. That difference is immaterial to the substance of this report.

demand share of the economy. That increase is offset to a degree, however, because a substantial portion of Iowa agricultural production is not destined for export sales. Most of Iowa's corn flows to in-state feed, ethanol, and corn sweetener manufacturers. Ag animals (e.g., swine and cattle) and animal products (e.g., milk and eggs) are processed primarily in the Iowa manufacturing sector. Accordingly, agriculture is an input into a substantial portion of Iowa's manufacturing sector just as manufactured goods (tractors, tires, implements, grain bins, animal pens, fertilizers, and ag chemicals) are inputs into agricultural output.

Using the method of analysis that solves for final demand satisfaction re-allocates economic activity in the state such that a complete and unduplicated accounting is arrived at to describe which industries and institutions are contributing to final demand sales via their direct activity and all of their linkages.

### Using the Final Demand Method to Determine Economic Importance

The final demand method for determining the relative contribution of different sectors to the Iowa economy begins with the assumption that sectors that primarily satisfy final demand are considered basic industries and those that mostly support those basic industries and their workers are classified as non-basic.<sup>3</sup> This method involves extracting the table of industrial accounts from a conventional IMPLAN model, known as the social accounts matrix (SAM), and then manually processing that table in a manner that is supplemental to standard input-output analysis software.<sup>4</sup> Done properly, the state totals in all relevant categories (output, value added, labor income, and jobs) do not change at all, but how those values are expressed within specific industries does, where their expression is a function of final demand for particular industrial commodities.<sup>5</sup>

The final demand transformation involves solving for and applying the elements of the equation:

$$X=AX+Y$$

Which can be re-written for our purposes as

$$X=(I-A)^{-1}Y$$

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<sup>3</sup> Final demanders include households, governments and other institutions, capital, and domestic and foreign exports.

<sup>4</sup> The subsequent analysis involves processing a 2018 IMPLAN, Inc., data set. IMPLAN is the most widely used economic impact assessment tool, and it has been maintained in the Department of Economics at Iowa State University continuously since the mid-1980s.

<sup>5</sup> The utility of this approach, though used for years here in Iowa, was re-introduced to the IO community recently in Watson, P., S. Cooke, D. Kay, and G. Alward. 2015. A Method for Improving Economic Contribution Studies for Regional Analysis. *Journal of Regional Policy and Analysis*, 45(1): 1-15.

Where:

X= output, A= matrix of coefficients, and Y= final demand ... and  
I= an identity matrix resulting from transforming the first equation into the second operational equation.

The  $X=(I-A)^{-1}$  component of the equation produces the detailed total requirements multipliers for each industry that are the fundamental drivers of the IO model. When the table of total requirements is multiplied times a matrix of final demands (Y), economic activity in the study area is reorganized in so far as it contributes to satisfying final demand. In other words, this procedure isolates the value of all backward linkages an industry has in producing for final demand. Firms meeting substantial final demand via export sales will see increases in their estimated total contribution to the state's economy (in terms of all linkages in satisfying final demand), and firms that are primarily suppliers to exporting firms will see decreases in their contributions. There is, of course, no change in each industry's direct economic activity, but this method reallocates that activity in so far as it supports, either directly (via a final demand sale) or indirectly (as part of the supply chain), final demand sales transactions.

A firm that supplies goods or services to a primarily exporting industry like manufacturing will find its values subsumed within that exporting sector's totals. An industry like agriculture with tremendous downstream linkages to Iowa manufacturers will find much of the value of what it produces expressed in food processing manufacturing or in ethanol production. Conversely, substantial fractions of manufacturing output like machinery, animal feeds, fertilizers, and chemicals purchased by farmers from Iowa manufacturers will be subsumed within agriculture's final demand values.

## Terminology

There are three direct and final demand variables reported in the subsequent tables:

- Value added comprises labor income, payments to proprietors, payments to investors, and indirect tax payments made by all industrial producers. Value added is analogous to gross domestic product (GDP), which is the standard measure of industrial activity for national, state, and now metropolitan and county units of analysis.
- Labor income (a component of value added) is made up of the wages, salaries, and benefits paid to workers. It also includes the salaries proprietors pay to themselves for the management of their operation.

- Jobs are the number of full and part time jobs in an industry over the course of a year. There are more jobs in the economy than employed persons as many people have more than one job.

Direct economic values are those that describe an industry's characteristics over the course of a calendar year – its value added and labor income payments, plus the jobs in the industry.

Final demand economic values take into account the amount of direct economic activity plus all supporting sector economic activity utilized in satisfying a sale to final demand.

Direct and final demand grand totals for all of the economic categories listed above equal one another.

## Final Demand Impacts

The summary tables to follow compare direct values in industries producing significantly for final demand with their final demand (primarily export sales-oriented) results. The criterion for selecting sectors to profile was where total jobs in the final demand summaries exceeded the direct jobs. More detailed values for both direct and final demand values are contained in Appendix A and Appendix B, respectively.

Agriculture, Food and Ag Product Manufacturing, and other Ag-related Industries Table 2 summarizes the ag sector, food and ag product manufacturing (animal feed, food products, and ethanol), and other ag-related manufacturers (machinery, chemicals, and fertilizers). Direct agricultural value added (or GDP) was estimated at \$7.74 billion in 2018, but the sum of all of its final demand sales linkages boosts that value to \$9.81 billion. As a significant fraction of ag production is converted into manufactured goods, the food and ag product manufacturing sector value added amount grows from \$8.80 billion in direct activity to \$23.30 billion considering all linkages as it produces for final demand sales. Value added for farm machinery, chemicals and fertilizer grows from \$3.15 billion in direct activity to \$4.71 billion using the final demand method.



TABLE 2

**Ag and Ag-Related Manufacturing Economic Values Comparing Direct Industrial Economic Measures with Final Demand Economic Measures (Dollar Amounts in Millions)**

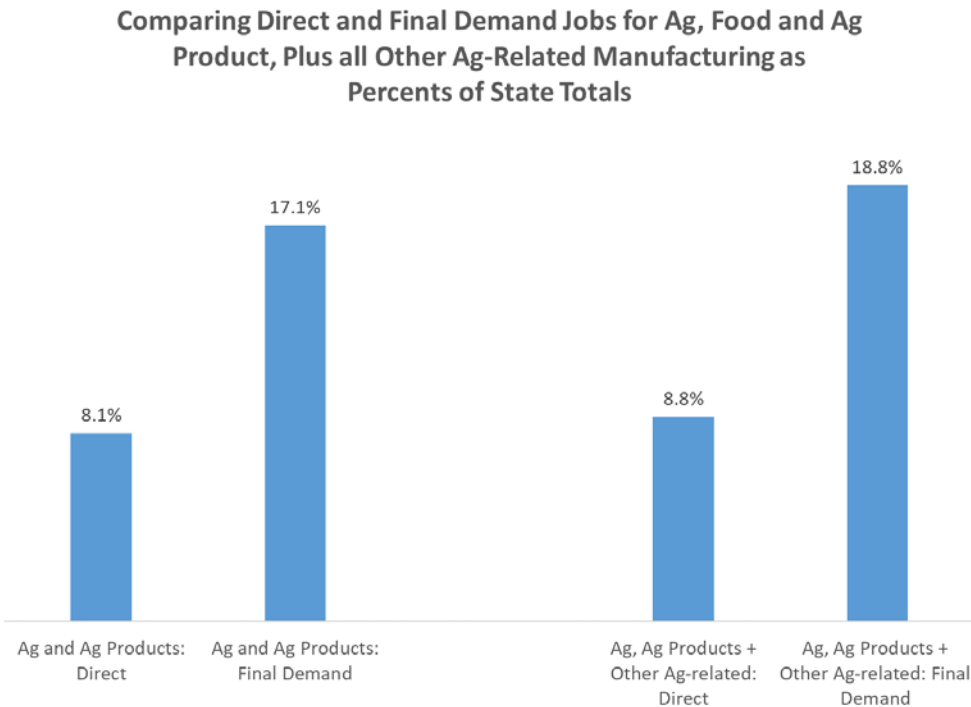
Direct:	Labor Income	Value Added	Jobs
Agriculture and Ag Services	\$ 3,621.7	\$ 7,740.2	102,247
Food and Ag Product Manufacturing	\$ 4,558.2	\$ 8,799.0	67,172
<b>Subtotal</b>	<b>\$ 8,179.9</b>	<b>\$ 16,539.2</b>	<b>169,419</b>
Farm Machinery, Chemicals, & Fertilizer	\$ 1,560.8	\$ 3,152.4	14,240
<b>Total Ag, Food, and All Ag-related Manufacturing</b>	<b>\$ 9,740.7</b>	<b>\$ 19,691.6</b>	<b>183,659</b>
Final Demand:			
Agriculture and Ag Services	\$ 4,924.8	\$ 9,809.4	111,431
Food and Ag Product Manufacturing	\$ 12,789.1	\$ 23,295.7	244,319
<b>Subtotal</b>	<b>\$ 17,713.8</b>	<b>\$ 33,105.1</b>	<b>355,750</b>
Farm Machinery, Chemicals, & Fertilizer	\$ 2,586.1	\$ 4,714.1	36,190
<b>Total Ag, Food, and All Ag-related Manufacturing</b>	<b>\$ 20,300.0</b>	<b>\$ 37,819.2</b>	<b>391,939</b>

TABLE 3

**Ag and Ag-Related Manufacturing Economic Values as Percents of Totals Comparing Direct Industrial Economic Measures with Final Demand Economic Measures**

Direct:	Labor Income	Value Added	Jobs
Agriculture and Ag Services	3.3%	4.1%	4.9%
Food and Ag Product Manufacturing	4.1%	4.6%	3.2%
<b>Subtotal</b>	<b>7.4%</b>	<b>8.7%</b>	<b>8.1%</b>
Farm Machinery, Chemicals, & Fertilizer	1.4%	1.7%	0.7%
<b>Total Ag, Food, and All Ag-related Manufacturing</b>	<b>8.8%</b>	<b>10.3%</b>	<b>8.8%</b>
Final Demand:			
Agriculture and Ag Services	4.4%	5.2%	5.3%
Food and Ag Product Manufacturing	11.6%	12.2%	11.7%
<b>Subtotal</b>	<b>16.0%</b>	<b>17.4%</b>	<b>17.1%</b>
Farm Machinery, Chemicals, & Fertilizer	2.3%	2.5%	1.7%
<b>Total Ag, Food, and All Ag-related Manufacturing</b>	<b>18.3%</b>	<b>19.9%</b>	<b>18.8%</b>

In all (Table 3), agriculture plus food and ag product manufacturing accounts for 17.1 percent of all jobs, 17.4 percent of all value added, and 16.0 percent of all labor income.<sup>6</sup> As is readily evident, these fractions are all substantially larger than the direct values. If agriculture machinery manufacturing, fertilizers, and ag chemicals are added to the summary, the job fraction grows to 18.8 percent, value added to 19.9 percent, and labor income to 18.3 percent (see Figure 1 for a display of the job differences).<sup>7</sup>



**FIGURE 1**

<sup>6</sup> Output is a value from the model that allows us to determine value added, labor income, and jobs. It is used in the model to identify these other values, but it is not reported in this study as it is not an economic figure that is used by governments to compare among industries or among the states in quarterly or annual reports. It reflects gross transactions that have occurred in the economy, which means little unless one determines how much value added (GDP), labor income to workers, and jobs are produced from that output.

<sup>7</sup> The adding of farm machinery, ag chemicals, and fertilizers is a combination of contrivance. The fraction of production in these sectors that flows into agricultural production for final demand sales is already captured in the modeling. The fraction that flows to satisfying non-Iowa demand is added here even though it is not supporting Iowa agricultural production. Further, there are many farm-linked fabricated metal products (grain bins, animal pens, and fencing, as examples) that likely have significant final demand sales. There is no practical way to apportion that in fabricated metals which is potentially farm-related versus that which is not. Those values are contained in subsequent tables summarizing manufacturing. Ag advocates and other stakeholders who are used to this expansive definition of ag-influenced economic activity inevitably use this larger set of numbers to promote the importance of agriculture to the state's economy. They are repeated here to maintain continuity with previous ISU studies.

## Manufacturing by Major Sector

Table 4 summarizes the manufacturing sector in Iowa considering its major subcategories. On a direct basis, Iowa manufacturing accounted for \$33.52 billion in value added in 2018 and 230,980 jobs. After accounting for all sales to final demand, however, value added attributed to manufacturing grew to \$62.48 billion, and jobs grew to 586,582. On a final demand basis, food and ag product manufacturing accounted for the largest share of value added production and jobs. The next highest was machinery manufacturing.<sup>8</sup>

**TABLE 4**

**Manufacturing Economic Values by Major Grouping Comparing Direct Industrial Economic Measures with Final Demand Economic Measures (Dollar Amounts in Millions)**

Direct:	Labor Income	Value Added	Jobs
Food and Ag Product Manufacturing	4,558.2	8,799.0	67,172
Other Nondurables	3,039.9	6,778.3	32,497
Primary and Fabricated Metals	2,078.5	2,955.0	28,853
Machinery	3,421.6	6,972.6	39,070
Electronics and Appliances	2,056.4	3,035.2	18,853
Motor Vehicles, Parts and Other Transportation Equip.	940.1	1,228.6	13,418
Other Durable	2,260.8	3,754.1	31,117
Total Manufacturing	\$ 18,355.5	\$ 33,522.9	230,980

Final Demand:	Labor Income	Value Added	Jobs
Food and Ag Product Manufacturing	12,789.1	23,295.7	244,319
Other Nondurables	4,479.2	8,997.5	65,703
Primary and Fabricated Metals	3,226.5	4,946.6	53,168
Machinery	6,242.4	11,723.1	94,111
Electronics and Appliances	3,477.4	5,374.0	46,009
Motor Vehicles, Parts and Other Transportation Equip.	1,640.6	2,447.0	27,128
Other Durable	3,403.3	5,696.7	56,144
Total Manufacturing	\$ 35,258.5	\$ 62,480.6	586,582

Table 5 contains the distinctions between direct activity and final demand activity as percentages of state economic totals. On a final demand basis, Iowa manufacturing accounts for 28.1 percent of all jobs, 32.8 percent of value added production, and 31.8 percent of all

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<sup>8</sup> It of course needs to be noted that the food and ag products manufacturing values reported here are also in Table 2. Machinery here contains farm machinery, and other nondurables contains all ag chemical, ethanol, and fertilizer manufacturing. This is because on a definitional basis, those sectors are, in fact, manufacturing even if they are attributed to agriculture by stakeholders.

labor income (see also Figure 2). The higher labor income percentage than job percentage means that per job, this sector, in satisfying final demand, produces wages and salaries across all jobs affected that are 13 percent greater than the state average for all jobs (31.8%/28.1%-1=13.2%).

Figure 2 displays the difference between direct economic values and final demand values for labor income, value added, and jobs. Again, the direct values tell us how the industry is measured using conventional, government statistics. The final demand values tell us the total amount of economic activity is associated with manufacturing producing for final demand. It reflects, due to export sales, the annualized economic impact of Iowa manufacturing and its comparative importance.

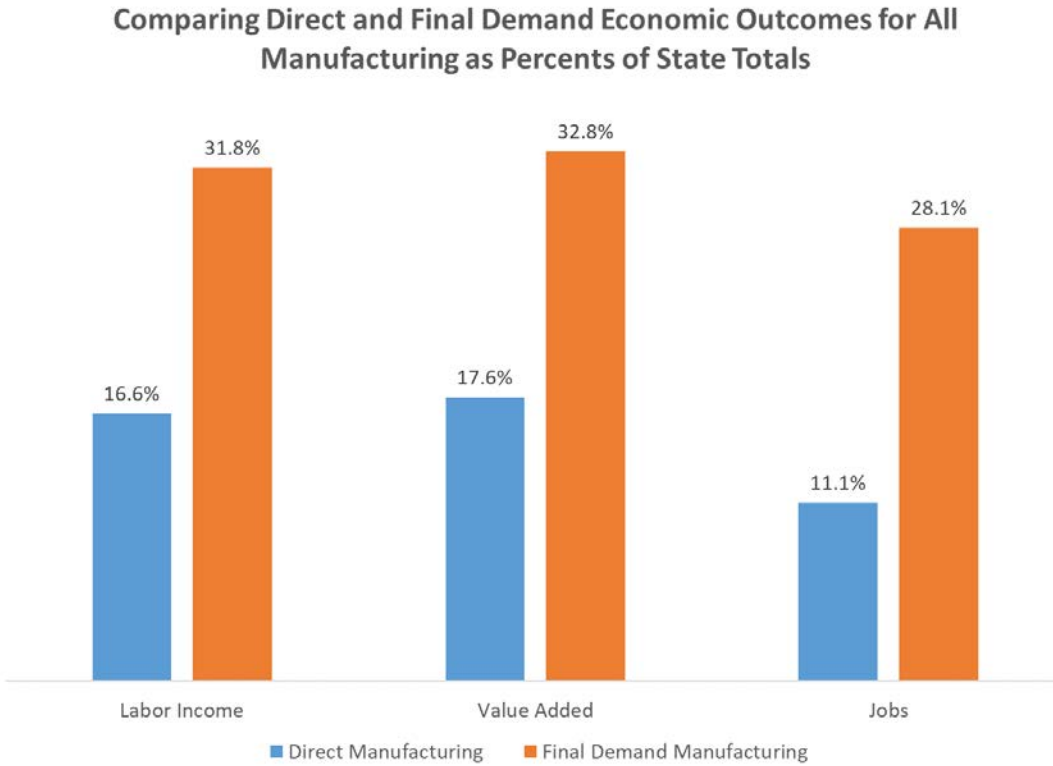
**TABLE 5**

**Manufacturing Economic Values by Major Grouping As Percents of Totals Comparing Direct Industrial Economic Measures with Final Demand Economic Measures**

Direct:	Labor Income	Value Added	Jobs
Food and Ag Product Manufacturing	4.1%	4.6%	3.2%
Other Nondurables	2.7%	3.6%	1.6%
Primary and Fabricated Metals	1.9%	1.6%	1.4%
Machinery	3.1%	3.7%	1.9%
Electronics and Appliances	1.9%	1.6%	0.9%
Motor Vehicles, Parts and Other Transportation Equip.	0.8%	0.6%	0.6%
Other Durable	2.0%	2.0%	1.5%
Total Manufacturing	16.6%	17.6%	11.1%

Final Demand:	Labor Income	Value Added	Jobs
Food and Ag Product Manufacturing	11.6%	12.2%	11.7%
Other Nondurables	4.0%	4.7%	3.2%
Primary and Fabricated Metals	2.9%	2.6%	2.6%
Machinery	5.6%	6.2%	4.5%
Electronics and Appliances	3.1%	2.8%	2.2%
Motor Vehicles, Parts and Other Transportation Equip.	1.5%	1.3%	1.3%
Other Durable	3.1%	3.0%	2.7%
Total Manufacturing	31.8%	32.8%	28.1%



**FIGURE 2**

#### Combined Agriculture and Manufacturing Final Demand Impacts

As has been mentioned before, there is significant overlap in Table 2 and Table 4. In characterizing the broader ag sector, ag related manufacturing was included, as it has been the practice in the past in these reports. In characterizing the manufacturing sector, those ag-related manufacturing sectors were counted as well. Table 6 summarizes, without duplication, the economic impact of the two sectors combined. Ag and manufacturing producing for final demand sales account for 36.3 percent of the state’s labor income, 38 percent of value added (GDP), and 33.5 percent of its jobs considering the entire supply chains affected by their sales.

**TABLE 6**

<b>Agriculture plus Manufacturing Combined Final Demand Economic Impacts (No Duplication)</b>			Percent of State Totals
	Final Demand Impacts		
Labor Income (Millions)	\$	40,183.3	36.3%
Value Added (Millions)	\$	72,290.0	38.0%
Jobs		698,013	33.5%

## Other Sectors Producing for Final Demand

The criterion for selecting the remaining other industries to profile was where final demand job totals were greater than direct job totals.<sup>9</sup> Mining, utilities, construction, all governments, and households comprise this group. Mining and utilities have minor amounts of export orientation and construction creates capital goods, which are final demands as well. The nonemployee cost of government service provision is also classified in this model as a final demand. Finally, households are a final demand contributor in as much as households in Iowa are able to derive incomes from non-Iowa sources, mainly from investment returns and government transfer payments. Households are not an industry, but they are still an important category as they explain a substantial fraction of direct industrial activity in Iowa.

In Table 6 it is clear that all government is the largest producer of direct value added (\$20.80 billion) within this grouping and jobs (252,826) followed at a substantial distance by the construction industry. After all final demand relationships are tallied, the all governments sector explains 329,953 jobs, but the institution of households in fact explains even more jobs at 361,864. Combined, the institutions of governments and households (receiving incomes transfers, pensions, and other investments), after summing all of their linkages, account for a third of all Iowa jobs and nearly a third of all labor incomes that are made in the state (Table 7).

As an item of interest, the utility sector, though producing more jobs in final demand calculations, yielded less labor income and value added when considering the sum of all industries contributing to its final demand sales. Although the industry directly generates very high labor incomes per job (\$113,980) and high value added per job (\$429,970), the labor incomes and value added per job in the supplying sectors for the fraction of utility output that is used by external sources is significantly lower than within Iowa's utilities.

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<sup>9</sup> Readers are able to compare other industries of interest. Those values can be found in Appendix A (direct values) and in Appendix B (final demand values).

**TABLE 7**

**Other Economic Values Comparing Direct Industrial Economic Measures with Final Demand Economic Measures (Dollar Amounts in Millions)**

Direct Values:	Labor Income	Value Added	Jobs
Mining	184.2	310.2	4,787
Utilities	878.9	3,246.1	7,711
Construction	7,418.0	8,504.4	125,409
All Governments & Govt. Enterprises	16,367.1	20,796.6	252,826
All Households	N/A	N/A	N/A
Total All Other Categories	\$ 24,848.2	\$ 32,857.3	390,733
Final Demand Values:			
Mining	231.1	388.5	5,152
Utilities	646.4	1,554.6	10,808
Construction	10,385.1	14,060.6	191,652
All Governments & Govt. Enterprises	19,213.2	26,664.7	329,953
All Households	15,147.4	28,092.7	361,864
Total All Other Categories	\$ 45,623.2	\$ 70,761.2	899,430

**TABLE 8**

**Other Economic Values As Percents of Totals Comparing Direct Industrial Economic Measures with Final Demand Economic Measures**

Direct Values:	Labor Income	Value Added	Jobs
Mining	0.2%	0.2%	0.2%
Utilities	0.8%	1.7%	0.4%
Construction	6.7%	4.5%	6.0%
All Governments & Govt. Enterprises	14.8%	10.9%	12.1%
All Households	N/A	N/A	N/A
Total All Other Categories	22.4%	17.3%	18.7%
Final Demand Values:			
Mining	0.2%	0.2%	0.2%
Utilities	0.6%	0.8%	0.5%
Construction	9.4%	7.4%	9.2%
All Governments & Govt. Enterprises	17.4%	14.0%	15.8%
All Households	13.7%	14.8%	17.4%
Total All Other Categories	41.2%	37.2%	43.1%

### Other Industry and Institutions Final Demand Job Values as Percents of State Totals

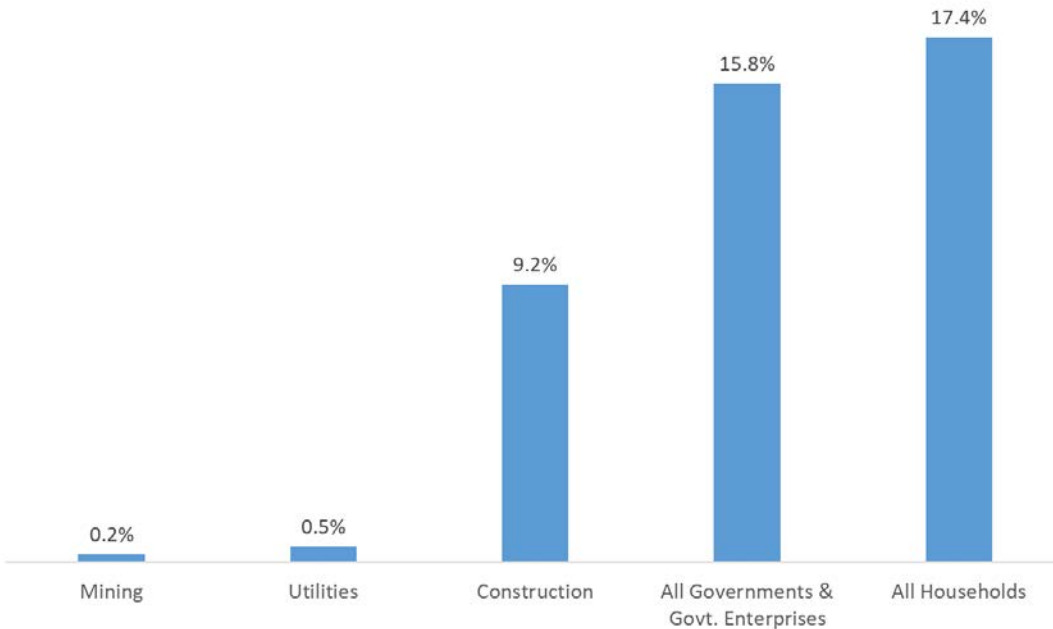


FIGURE 3

### Conclusion

This evaluation identified which Iowa industries are more export and final demand sales-oriented and measured the sum of economic activity in the state that they stimulate via their in-state supply chains and all associated labor demands. The final demand approach demonstrates that Iowa's manufacturing sector export and final demand sales account for 28.1 percent of all Iowa jobs and 32.8 percent of the state's GDP. No other private sector industrial combination comes close to that. The second largest final demand satisfying sector in Iowa is all governments (federal, state, and local). They explain 15.8 percent of all jobs and 14.0 percent of all value added. Finally, households, because they have out-of-Iowa income sources from transfers, pensions, and investments explain 17.4 percent of the state's jobs and 14.8 percent of all value added produced in Iowa.

Agriculture's final demand contributions considering only farm output explain 11.7 percent of all jobs and 13.2 percent of state value added. When agriculture includes food and ag product manufacturing and other ag-related manufacturing, that combination accounts for 18.8 percent of Iowa jobs and 19.9 percent of value added.



## Appendix A: Detailed Direct Industrial Values

### Iowa Direct Industrial Values: 2018

*Financial Amounts in \$ Millions*

	Labor Income	Value Added	Jobs
Crops	1,429.9	3,497.1	26,288
Animals	1,561.0	3,702.7	61,651
Ag Services	630.7	540.4	14,307
Other Resource	39.8	47.1	1,245
Mining	184.2	310.2	4,787
Utilities	878.9	3,246.1	7,711
Construction	7,418.0	8,504.4	125,409
Food Mfg & AG Related	4,558.2	8,799.0	67,172
Other Nondurable	2,651.0	5,635.6	30,486
Fertilizers & Ag Chemicals	388.9	1,142.6	2,012
Other Durable	2,260.8	3,754.1	31,117
Primary Metals	662.4	1,068.0	7,561
Fabricated Metals	1,416.1	1,887.0	21,292
Farm Machinery	1,171.9	2,009.7	12,229
Machinery	2,249.7	4,962.9	26,841
Electronics & Appliances	2,056.4	3,035.2	18,853
Motor Vehicles & Parts	722.8	868.2	10,903
Other Transportation Equip	217.3	360.5	2,514
Wholesale	5,831.4	11,770.9	70,043
Retail	5,533.5	8,323.4	194,759
Transportation	4,905.4	6,488.1	80,465
Information	1,745.6	4,399.6	25,668
Finance & Insurance	9,598.6	25,031.7	133,758
Real Estate	1,282.1	17,374.1	65,966
Business Services	576.1	1,543.9	9,851
Professional Services	6,879.8	8,628.8	101,261
Management of Companies	5,370.0	6,333.4	108,947
Private Education	1,199.6	1,303.9	37,481
Medical & Social Services	11,751.4	12,847.0	217,735
Entertainment	602.6	1,251.6	35,008
Accommodations & Food Services	3,399.2	5,166.6	150,427
Personal Services	5,182.8	5,742.7	128,339
Govts & Enterprises	16,367.1	20,796.6	252,826
Total All Industries	\$ 110,723.3	\$ 190,373.1	2,084,914

## Iowa Direct Industrial Values: 2018

*As Percentages of Totals*

	Labor Income	Value Added	Jobs
Crops	1.3%	1.8%	1.3%
Animals	1.4%	1.9%	3.0%
Ag Services	0.6%	0.3%	0.7%
Other Resource	0.0%	0.0%	0.1%
Mining	0.2%	0.2%	0.2%
Utilities	0.8%	1.7%	0.4%
Construction	6.7%	4.5%	6.0%
Food Mfg & AG Related	4.1%	4.6%	3.2%
Other Nondurable	2.4%	3.0%	1.5%
Fertilizers & Ag Chemicals	0.4%	0.6%	0.1%
Other Durable	2.0%	2.0%	1.5%
Primary Metals	0.6%	0.6%	0.4%
Fabricated Metals	1.3%	1.0%	1.0%
Farm Machinery	1.1%	1.1%	0.6%
Machinery	2.0%	2.6%	1.3%
Electronics & Appliances	1.9%	1.6%	0.9%
Motor Vehicles & Parts	0.7%	0.5%	0.5%
Other Transportation Equip	0.2%	0.2%	0.1%
Wholesale	5.3%	6.2%	3.4%
Retail	5.0%	4.4%	9.3%
Transportation	4.4%	3.4%	3.9%
Information	1.6%	2.3%	1.2%
Finance & Insurance	8.7%	13.1%	6.4%
Real Estate	1.2%	9.1%	3.2%
Business Services	0.5%	0.8%	0.5%
Professional Services	6.2%	4.5%	4.9%
Management of Companies	4.8%	3.3%	5.2%
Private Education	1.1%	0.7%	1.8%
Medical & Social Services	10.6%	6.7%	10.4%
Entertainment	0.5%	0.7%	1.7%
Accommodations & Food Services	3.1%	2.7%	7.2%
Personal Services	4.7%	3.0%	6.2%
Govts & Enterprises	14.8%	10.9%	12.1%
<b>Total All Industries</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

## Appendix B: Final Demand Economic Values

### Iowa Final Demand Industrial Values: 2018

*Financial Amounts in \$ Millions*

	Labor Income	Value Added	Jobs
Crops	2,534.0	5,110.2	51,078
Animals	2,376.4	4,683.9	60,025
Ag Services	14.4	15.3	327
Other Resource	20.8	27.6	588
Mining	231.1	388.5	5,152
Utilities	646.4	1,554.6	10,808
Construction	10,385.1	14,060.6	191,652
Food Mfg & AG Related	12,789.1	23,295.7	244,319
Other Nondurable	3,924.8	7,766.9	58,920
Fertilizers & Ag Chemicals	554.5	1,230.6	6,783
Other Durable	3,403.3	5,696.7	56,144
Primary Metals	1,174.1	1,932.4	18,044
Fabricated Metals	2,052.5	3,014.2	35,124
Farm Machinery	2,031.7	3,483.4	29,407
Machinery	4,210.8	8,239.6	64,704
Electronics & Appliances	3,477.4	5,374.0	46,009
Motor Vehicles & Parts	1,288.5	1,854.1	21,910
Other Transportation Equip	352.1	592.9	5,218
Wholesale	2,489.0	4,676.5	40,421
Retail	738.4	1,226.2	22,357
Transportation	1,438.4	2,308.3	26,112
Information	759.7	1,620.0	14,283
Finance & Insurance	7,817.9	20,027.9	123,875
Real Estate	537.2	1,461.0	17,160
Business Services	180.6	510.1	3,534
Professional Services	4,436.8	6,291.7	72,224
Management of Companies	572.9	777.0	12,772
Private Education	414.1	556.8	11,937
Medical & Social Services	2,381.0	3,101.9	58,497
Entertainment	129.2	256.6	5,060
Accommodations & Food Services	1,619.0	2,679.9	48,558
Personal Services	1,381.9	1,800.4	30,093
Govts & Enterprises	19,213.2	26,664.7	329,953
Low Income: Households	6,198.2	11,667.2	149,692
Middle Income: Households	5,596.6	10,351.7	131,721
Upper Income: Households	3,352.7	6,073.7	80,451
<b>Total All Industries</b>	<b>\$ 110,723.3</b>	<b>\$ 190,373.1</b>	<b>2,084,914</b>

## Iowa Final Demand Industrial Values: 2018

*As Percentages of Totals*

	Labor Income	Value Added	Jobs
Crops	2.3%	2.7%	2.4%
Animals	2.1%	2.5%	2.9%
Ag Services	0.0%	0.0%	0.0%
Other Resource	0.0%	0.0%	0.0%
Mining	0.2%	0.2%	0.2%
Utilities	0.6%	0.8%	0.5%
Construction	9.4%	7.4%	9.2%
Food Mfg & AG Related	11.6%	12.2%	11.7%
Other Nondurable	3.5%	4.1%	2.8%
Fertilizers & Ag Chemicals	0.5%	0.6%	0.3%
Other Durable	3.1%	3.0%	2.7%
Primary Metals	1.1%	1.0%	0.9%
Fabricated Metals	1.9%	1.6%	1.7%
Farm Machinery	1.8%	1.8%	1.4%
Machinery	3.8%	4.3%	3.1%
Electronics & Appliances	3.1%	2.8%	2.2%
Motor Vehicles & Parts	1.2%	1.0%	1.1%
Other Transportation Equip	0.3%	0.3%	0.3%
Wholesale	2.2%	2.5%	1.9%
Retail	0.7%	0.6%	1.1%
Transportation	1.3%	1.2%	1.3%
Information	0.7%	0.9%	0.7%
Finance & Insurance	7.1%	10.5%	5.9%
Real Estate	0.5%	0.8%	0.8%
Business Services	0.2%	0.3%	0.2%
Professional Services	4.0%	3.3%	3.5%
Management of Companies	0.5%	0.4%	0.6%
Private Education	0.4%	0.3%	0.6%
Medical & Social Services	2.2%	1.6%	2.8%
Entertainment	0.1%	0.1%	0.2%
Accommodations & Food Services	1.5%	1.4%	2.3%
Personal Services	1.2%	0.9%	1.4%
Govts & Enterprises	17.4%	14.0%	15.8%
Low Income: Households	5.6%	6.1%	7.2%
Middle Income: Households	5.1%	5.4%	6.3%
Upper Income: Households	3.0%	3.2%	3.9%
<b>Total All Industries</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

