OHFOOD: An Ohio Food Industries Input-Output Model

(Version 10.0, April 2008)

by Thomas L. Sporleder¹

Abstract

OHFOOD, an acronym for Ohio food, is a sophisticated input-output model. The model is designed specifically to capture the interdependencies and linkages among various sectors and industries composing the complex economy of Ohio. The input-output model of Ohio's economy also maintains substantial detail on the food and agricultural sectors. The interindustry model describes the linkages among various sectors of the economy and is designed specifically to provide estimates of the economic importance of the food and agriculture-related cluster, along with the general manufacturing and service sectors, of the Ohio economy. Also, OHFOOD provides several types of economic multipliers for detailed food and agriculture-related sectors of the economy.

This executive summary provides a brief overview of the importance of food and agriculture to the state's economy, based on the interindustry model. The analysis indicates that for 2006 the food and agricultural cluster of Ohio's economy contributed 11 percent of the output, added 8 percent to Ohio's gross state product, accounted for 14 percent of the total employment, and contributed 8 percent of total income.

In 2006, the Ohio economy generated a gross state product (GSP) of \$461.3 billion. The food and agricultural cluster's share of this GSP was \$38.3 billion, or \$8.31 of each \$100 of Ohio GSP. For 2006 the contributions to GSP for the five components of the agrifood cluster are \$1.7 billion for farm inputs, machinery, and professional services; another \$2.6 billion from agricultural production; about \$12.4 billion from processing; an additional \$12.8 from food wholesaling and retailing; and another \$8.7 billion in food services.

Of these 5 major components comprising the food and agricultural-related cluster, the food wholesaling and retailing sectors are the largest in terms of contribution to GSP, contributing about one-third of the total contribution to GSP of \$38.3 billion by the entire food and agriculture cluster. Processing food and forestry-related products is the second largest sector in terms of GSP, accounting for another one-third to the total GSP of \$38.3 billion by the entire food and agriculture cluster. The food service sector is notable for its contribution to employment. This sector accounts for over 416,000 jobs, or 45 of every 100 jobs within the entire agrifood cluster. The total food and agriculture complex employs over 924 thousand jobs in Ohio in 2006, or about one of every seven jobs (14 percent) in Ohio.

Keeping the OHFOOD model updated with the latest data available is an on-going task of the Farm Income Enhancement Program within the Department of Agricultural, Environmental, and Development Economics of The Ohio State University. The complete study may be printed from a downloadable pdf file available from the AED Economics Department of The Ohio State University at: http://aede.osu.edu/resources/docs/display.php?cat=21

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Table 1. Ohio: Output, Gross State Product, Income, and Employment, 2006.

Total Output			Gross State		
Farm Inputs, Equip & Prof Services		Total Output	Product (GSP)	Income	Employment
Farm Inputs, Equip & Prof Services		\$ Millions	\$ Millions	\$ Millions	Person Years
Farming Beef & Dairy Cattle, Milk Production 1,155.7 116.5 92.2 13,803 Poultry & Egg Production 471.7 205.5 203.9 1,449 Hogs & Other Farm Animals* 489.9 59.6 52.1 16,833 Grains 1,092.2 528.6 508.9 26,773 Soybeans & Other Oil Crops 1,191.2 648.3 622.4 18,826 Milsc Crops, Hay, Sugar, Tobacco & Nuts 454.8 238.4 229.7 3,905 Fruits & Vegetables 283.6 177.1 173.7 3,905 Fruits & Vegetables 283.8 177.1 173.7 3,905 Forestry, Hunting & Fishing 652.3 159.5 153.1 3,906 Forestry, Hunting & Fishing 652.3 159.5 153.1 3,906 Forestry, Hunting & Fishing 30,016.7 6,864.8 6,355.6 59,597 70cessing 5,729.4 1,226.6 1,181.6 7,833 7,226.5 7,224.4 1,226.6 1,181.6 7,833 7,226.5 7,224.4 1,447.4		0.745.0	4 000 0	4 000 0	22.722
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Hogs & Other Farm Animals*		•			
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Motor Vehicles, Allied Equip & Services 89,927.2 21,999.1 20,186.7 273,079 Transportation & Communication 26,161.7 11,137.5 10,790.5 145,953 Computer & Electronic Products 16,037.8 7,546.1 7,435.9 91,098 Publishing & Information Technologies 14,261.6 7,182.2 7,075.2 80,718 Wholesale & Retail Trade 66,459.2 44,246.6 35,149.8 683,971 Business, Professional & Personal Services ^c 76,813.1 42,275.8 41,333.7 771,005 Financial, Legal & Real Estate 134,952.0 91,144.5 81,933.0 595,306 Leisure Activities & Entertainment 27,606.8 13,919.5 12,240.5 240,073 Health Care & Social Assistance 71,576.4 40,261.7 39,763.2 789,046 Electricity, Gas & Sanitary 15,839.4 9,817.9 8,459.0 41,145 Education Services 43,904.2 41,287.0 41,252.6 801,797 Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0	· ·	3,024.9	1,010.0	992.8	15,971
Motor Vehicles, Allied Equip & Services 89,927.2 21,999.1 20,186.7 273,079 Transportation & Communication 26,161.7 11,137.5 10,790.5 145,953 Computer & Electronic Products 16,037.8 7,546.1 7,435.9 91,098 Publishing & Information Technologies 14,261.6 7,182.2 7,075.2 80,718 Wholesale & Retail Trade 66,459.2 44,246.6 35,149.8 683,971 Business, Professional & Personal Services ^c 76,813.1 42,275.8 41,333.7 771,005 Financial, Legal & Real Estate 134,952.0 91,144.5 81,933.0 595,306 Leisure Activities & Entertainment 27,606.8 13,919.5 12,240.5 240,073 Health Care & Social Assistance 71,576.4 40,261.7 39,763.2 789,046 Electricity, Gas & Sanitary 15,839.4 9,817.9 8,459.0 41,145 Education Services 43,904.2 41,287.0 41,252.6 801,797 Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0		43,912.7	16,373.0	16,005.6	202,447
Computer & Electronic Products 16,037.8 7,546.1 7,435.9 91,098 Publishing & Information Technologies 14,261.6 7,182.2 7,075.2 80,718 Wholesale & Retail Trade 66,459.2 44,246.6 35,149.8 683,971 Business, Professional & Personal Services ^c 76,813.1 42,275.8 41,333.7 771,005 Financial, Legal & Real Estate 134,952.0 91,144.5 81,933.0 595,306 Leisure Activities & Entertainment 27,606.8 13,919.5 12,240.5 240,073 Health Care & Social Assistance 71,576.4 40,261.7 39,763.2 789,046 Electricity, Gas & Sanitary 15,839.4 9,817.9 8,459.0 41,145 Education Services 43,904.2 41,287.0 41,252.6 801,797 Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0 0.0 61,501 Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493 <td>Motor Vehicles, Allied Equip & Services</td> <td>89,927.2</td> <td>21,999.1</td> <td>20,186.7</td> <td>273,079</td>	Motor Vehicles, Allied Equip & Services	89,927.2	21,999.1	20,186.7	273,079
Publishing & Information Technologies 14,261.6 7,182.2 7,075.2 80,718 Wholesale & Retail Trade 66,459.2 44,246.6 35,149.8 683,971 Business, Professional & Personal Services ^c 76,813.1 42,275.8 41,333.7 771,005 Financial, Legal & Real Estate 134,952.0 91,144.5 81,933.0 595,306 Leisure Activities & Entertainment 27,606.8 13,919.5 12,240.5 240,073 Health Care & Social Assistance 71,576.4 40,261.7 39,763.2 789,046 Electricity, Gas & Sanitary 15,839.4 9,817.9 8,459.0 41,145 Education Services 43,904.2 41,287.0 41,252.6 801,797 Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0 0.0 61,501 Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493	Transportation & Communication	26,161.7	11,137.5	10,790.5	145,953
Wholesale & Retail Trade 66,459.2 44,246.6 35,149.8 683,971 Business, Professional & Personal Services* 76,813.1 42,275.8 41,333.7 771,005 Financial, Legal & Real Estate 134,952.0 91,144.5 81,933.0 595,306 Leisure Activities & Entertainment 27,606.8 13,919.5 12,240.5 240,073 Health Care & Social Assistance 71,576.4 40,261.7 39,763.2 789,046 Electricity, Gas & Sanitary 15,839.4 9,817.9 8,459.0 41,145 Education Services 43,904.2 41,287.0 41,252.6 801,797 Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0 0.0 61,501 Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493	Computer & Electronic Products	16,037.8	7,546.1	7,435.9	91,098
Business, Professional & Personal Services ^c 76,813.1 42,275.8 41,333.7 771,005 Financial, Legal & Real Estate 134,952.0 91,144.5 81,933.0 595,306 Leisure Activities & Entertainment 27,606.8 13,919.5 12,240.5 240,073 Health Care & Social Assistance 71,576.4 40,261.7 39,763.2 789,046 Electricity, Gas & Sanitary 15,839.4 9,817.9 8,459.0 41,145 Education Services 43,904.2 41,287.0 41,252.6 801,797 Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0 0.0 61,501 Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493	Publishing & Information Technologies	14,261.6			
Financial, Legal & Real Estate 134,952.0 91,144.5 81,933.0 595,306 Leisure Activities & Entertainment 27,606.8 13,919.5 12,240.5 240,073 Health Care & Social Assistance 71,576.4 40,261.7 39,763.2 789,046 Electricity, Gas & Sanitary 15,839.4 9,817.9 8,459.0 41,145 Education Services 43,904.2 41,287.0 41,252.6 801,797 Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0 0.0 61,501 Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493				•	
Leisure Activities & Entertainment 27,606.8 13,919.5 12,240.5 240,073 Health Care & Social Assistance 71,576.4 40,261.7 39,763.2 789,046 Electricity, Gas & Sanitary 15,839.4 9,817.9 8,459.0 41,145 Education Services 43,904.2 41,287.0 41,252.6 801,797 Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0 0.0 61,501 Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493		76,813.1			
Health Care & Social Assistance 71,576.4 40,261.7 39,763.2 789,046 Electricity, Gas & Sanitary 15,839.4 9,817.9 8,459.0 41,145 Education Services 43,904.2 41,287.0 41,252.6 801,797 Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0 0.0 61,501 Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493	Financial, Legal & Real Estate			81,933.0	
Electricity, Gas & Sanitary 15,839.4 9,817.9 8,459.0 41,145 Education Services 43,904.2 41,287.0 41,252.6 801,797 Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0 0.0 61,501 Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493	Leisure Activities & Entertainment	•	13,919.5	•	•
Education Services 43,904.2 41,287.0 41,252.6 801,797 Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0 0.0 61,501 Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493		1.2721.211			
Government, Military & Non-Profit 25,220.2 16,471.7 16,452.0 291,033 Others (Households & Sector Adjustment) 0.0 0.0 0.0 61,501 Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493		· ·			
Others (Households & Sector Adjustment) 0.0 0.0 0.0 61,501 Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493					
Total of Mfg & Service Sectors 831,631.7 422,988.2 395,982.4 5,753,493			•	•	•
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Total Economy 929,852.9 461,302.0 429,946.8 6,677,849	Total of Mfg & Service Sectors	831,631.7	422,988.2	395,982.4	5,753,493
	Total Economy	929,852.9	461,302.0	429,946.8	6,677,849

Note: The wholesaling and retailing sector is one sector in the input-output model but is disaggregated. *County Business Patterns* 2005 is used to estimate the percentage of payroll and employment that is attributable to the food cluster. The percentage of payroll (22.5) is used to estimate the proportion of food cluster output, gross national product, and income. The percentage of employment (27.2) is used to estimate the proportion of food cluster employment.

^a Other farm animals include sheep, goats, horses, aquaculture production, & miscellaneous livestock.

^b Excludes hotel/motel food service.

^c Includes diverse service items such as advertising, cleaning, barber and beauty shops, and funerals. Source: Computed