SDSU

ECONOMICS COMMENTATOR

South Dakota State University No. 493 February 5, 2008

The Impact of Agriculture on the Economy of South Dakota

Gary Taylor
Associate Professor

Agricultural production, whether it is crops or livestock, has traditionally played a large role in the economic prosperity of South Dakota. In the last few years the value of agricultural commodities produced in the state has averaged about $6 billion annually. The impacts of this productivity go beyond the agricultural sector. The effects of this production are threefold, the direct, indirect, and induced. The direct effect is the actual value of the commodities produced in the state. The indirect effect is the business to business activity that is created through the processing of these commodities. The induced effect is the additional consumer spending resulting from the increased economic activity in the state. These three effects then accurately describe the total economic effect that agriculture has on the South Dakota economy.

There will be two separate parts to this analysis. Initially only the impact of production agriculture will be considered. Then, the effects of agricultural processing and manufacturing will be included.

Methodology

To analyze the impact of agriculture on the state of South Dakota the input-output modeling software IMPLAN Pro was employed. This software was originally developed for the National Forest Service and has been adapted for commercial use. The economic relationships among industries in South Dakota are modeled by the internal production functions imbedded within the program.

Underlying Assumptions

In this analysis we are looking at the 2004 data for South Dakota. The industry outputs employed are those that are already included in the IMPLAN Pro database. These outputs are actual gross sales, not Gross Domestic Product (GDP). Therefore, the cost of the inputs included in the production process are included, not excluded as they would be in a measure of GDP. The value of the industry output for IMPLAN Pro is $52.018 billion as compared to a GDP of $29.519 billion for South Dakota in 2004 (Bureau of Economic Analysis). $52 billion would therefore accurately reflect the dollars flowing through the South Dakota economy during 2004.

Production Agriculture Analysis

In the initial analysis only the impact of production agriculture is examined. Using the IMPLAN Pro division of industries by North American Industry Classification System (NAICS) code the 509 different industry classifications in the model are divided into twenty different categories. Agriculture, forestry, fishing, and hunting are combined into one category. The remaining 19 are mining, utilities, construction, manufacturing, wholesale trade, transportation and warehousing, retail trade, information, finance and insurance, real estate and rental, scientific and technical services, management of companies, administrative and waste services, educational services, health and social services, entertainment and recreation, accommodation and food services, other services, and government and non NAICS.

The direct effect represents the value of the products produced in the agricultural sector (Table 1). The indirect effect is the increased economic activity that would result in the industries supplying inputs into the ag sector (business to business activity). The induced effect is the increase in household spending resulting from the increased economic activity in the state. The $5.954 billion is 11.45% of the $52.018 billion total activity for the state.

Table 1. Value of Ag Category Output (nominal 2004 dollars)

Direct	$5,954,319,982
Indirect	$4,144,826,634
Induced	$2,399,431,975
Total	**$12,498,578,690**

The employment effects are similar to the output effects (Table 2). The direct effect is the number of people employed in the agricultural industries. The indirect effect is the employment in the industries supplying inputs to the ag industries and the induced effect is the additional employment resulting from the increased economic activity in the state.

Table 2. Ag Category Employment (number of employees) and Indirect Business Taxes (in nominal 2004 dollars)

	Employment	Indirect Business Taxes
Direct	42,045.2	$135,978,928
Indirect	11,094.2	$135,733,592
Induced	262.2	$113,283,449
Total	**53,401.6**	**$384,995,966**

The indirect business taxes are all of the taxes collected (sales, property, etc.), excluding income taxes, which does not affect South Dakota (Table 2). The direct effect is the tax revenue generated by the agricultural industries. The indirect effect results from the increased business to business activity and the induced effect is from the increased consumer activity associated with the agricultural production in the state.

The output multiplier for agricultural industries in South Dakota is 2.099. This means that each dollar of revenue generated in agricultural industries in the state generates an additional $1.099 worth of economic activity in the state. This multiplier does not represent the number of times a dollar is "turned over" in the economy. It is a real increase in business activity. The ag sector multiplier compares favorably with other industries. The construction and manufacturing sectors have the highest multipliers at 2.161 and 2.150, respectively. The utilities sector has the lowest multiplier at 1.546.

Ag Production and Processing/Manufacturing

In order to get a more accurate estimate of the real impact of agriculture on the state of South Dakota, it is necessary to include the industries from the manufacturing sector that can clearly be identified as ag related. For this analysis these industries include flour milling, soybean processing, fluid milk, cheese, dry milk, animal slaughter, meat processing, poultry processing, dry pasta, wineries, leather, sawmills, and ethanol. The sum of the output for these industries is $3,222,126,000 (Table 3). This amount is 6.19% of the total output for the state. Substantial employment and taxes also derive from the ag industry (Table 4). Since the explanation of the three effects was included in the previous section they will not be repeated here.

Table 3. Value of Ag Industry Output (nominal 2004 dollars)

Direct	$3,222,126,000
Indirect	$2,455,633,364
Induced	$1,252,477,308
Total	**$6,930,236,902**

Table 4. Ag industry Employment (number of employees) and Indirect Business Taxes (in nominal 2004 dollars)

	Employment	Indirect Business Taxes
Direct	11,658.5	$17,605,620
Indirect	16,246.8	$83,121,230
Induced	14,403.5	$59,132,321
Total	**42,308.8**	**$159,859,174**

Total Impact of Agriculture

In order to get a complete picture of the total impact the agricultural sector has on the South Dakota economy the production agriculture and ag business sector outputs were combined and their total impact estimated. These two sectors have a combined output of $9,176,445,952. This amount is 17.65% of the state output. As before, since the explanation of the effects is included earlier in the analysis, it is not repeated here.

Table 5. Total Impact of Agriculture (nominal 2004 dollars)

Direct	$9,176,445,952
Indirect	$6,387,761,692
Induced	$3,697,862,738
Total	**$19,262,070,228**

Table 6. Total Ag Employment (number of employees) and Indirect Business Taxes (in nominal 2004 dollars)

	Employment	Indirect Business Taxes
Direct	64,797.6	$209,562,704
Indirect	43,135.6	$209,184,589
Induced	42,526.1	$174,585,754
Total	**150,459.3**	**$593,333,046**

Concluding Remarks

As may be seen through the results of this analysis, agriculture remains a major contributor to the economic health of the state of South Dakota. The agricultural sector in the state has a total impact of $19,262,070,228 in economic activity, employs 150,459 people, and contributes $593,333,046 in tax revenues to the state. Furthermore, each dollar of ag revenue generated in the state creates another $1.099 in additional economic activity. This makes agriculture a potent engine for economic development within the state. The expansion of the ethanol industry and the increase in commodity prices since 2004 would serve to further increase the importance of agriculture in the state.

ECONOMICS COMMENTATOR
****
Economics Department
South Dakota State University Phone: 605-688-4141
Box 504 Scobey Hall Fax: 605-688-6386
Brookings, SD 57007-0895 E-Mail: Penny_Stover@ sdstate.edu

150 copies of this newsletter were produced at a cost of less than $100

****

Visit the ECONOMICS DEPARTMENT WEBSITE:

http://econ.sdstate.edu/

New Publications by SDSU Economists:

"Review and Analysis of International and Budgetary Considerations for the 2007 U.S. Farm Bill," by Bashir **Qasmi** and Evert **Van der Sluis**. http://agecon.lib.umn.edu/cgi-bin/pdf_view.pl?paperid=29340&ftype=.pdf

"The Efficacy of the Grid Marketing Channel for Fed Cattle," by Scott **Fausti**, Bashir **Qasmi,** and Matthew **Diersen**. http://agecon.lib.umn.edu/cgi-bin/pdf_view.pl?paperid=29223&ftype=.pdf

"**Managing Risk in Dynamic Times"** (Ranch Management), by Robert Gates, Barry Dunn, Jack **Davis**, Marty **Beutler**, and Agustine Arzeno. http://agbiopubs.sdstate.edu/articles/EC924.pdf

SOUTH DAKOTA STATE UNIVERSITY
Department of Economics
Box 504
Brookings SD 57007-0895

Change Service Requested