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# Measuring the Impact of Natural Disasters on Key Sectors of the Food and Fiber Industry in Mississippi

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The food and fiber system is an integrated system that includes farm and forestry production plus the sectors that supply farms and the sectors that process its production, distribution, and preparation system. The Mississippi Food and Fiber Industry is a multi-billion dollar enterprise in the state. The heavy losses from disasters in 2005 will require huge federal support if this industry is to remain viable in an increasingly global and competitive agricultural world.

The destruction caused by hurricanes Katrina and Rita in Mississippi and the Southeastern United States was the worst in the country's history. This destruction will significantly impact the entire food and fiber industry over the next 12 to 15 months and beyond. Farmers in the state will have to make difficult decisions and become more than just managers of a production process or farm but managers with a focus on business strategy.

Besides the loss of aquaculture, livestock, row crops, and buildings and equipment, the disasters destroyed more than 70 percent of the U.S. oil refineries in 2005. This resulted in higher-than-normal energy prices for farmers in Mississippi. By some accounts, the price for gasoline and diesel rose more than 33 percent after Hurricanes Katrina and Rita hit the state. Estimates were not made of the impact of farm fuel losses on the food and fiber sector in the state. This study analyzes the value of farm losses in poultry, dairy, beef, aquaculture, rice, and fruits and vegetables on the food and fiber sector in Mississippi (Myles 2006).

## Natural Disasters and Damages

Mississippi enjoys fairly predictable weather patterns throughout the year. The weather is extremely hot during the summer and fairly mild during the winter. Rarely does the state experience prolonged periods of cold, drought, or rain.

Although Mississippi has had its share of hurricanes, never has the state been so impacted by weather-related events as it was in 2005. Hurricanes Katrina and Rita, which struck the Mississippi Gulf Coast and other areas of the state in August 2005, were the most destructive hurricanes to ever hit the United States, causing damages exceeding \$2 billion in agriculture alone. Some of these damages will take 15 to 20 years to recover. By comparison, when Hurricane Camille devastated the Mississippi Gulf Coast in 1969, killing more than 150 people and destroying millions of dollars in property, it took the state several years to recover.

## Industry Overview

In 2003, the food and fiber industry was a major component of the Mississippi economy. During this period food and fiber contributed 637,233 jobs, or 44.1 percent of state employment, according to our sectoring scheme. In that same year, food and fiber paid \$17.25 billion in labor income, or 39.49 percent of total state labor income (employee compensation + proprietor income). The food and fiber industry also created \$26.61 billion of value-added income, or 40.57 percent of total value-added in the state. This suggested that about \$1 out of every \$2.50 in value added can be attributed to the state's food and fiber industry.

## Purpose and Objective

This paper evaluates the potential economic impact of Hurricane Katrina on the food and fiber system and linkages to other industries in Mississippi, absent help from the federal government, and determines the potential short-, intermediate-, and long-term effects of this disaster on the food and fiber system and related industries in Mississippi.

## Methods, Procedures, and Data Sources

To provide a compact presentation of this complex system, the authors collapsed the 509 IMPLAN sec-

tors into 23 major sectors using methods similar to Popp et al. (2005). The food and fiber components are in 22 sectors while the rest of the economy is aggregated into the sector called "rest of Mississippi." Table 1 shows the 22 sectors aggregated from the IMPLAN sectors they represent.

The IMPLAN Input-Output model and 2002 data set for Mississippi counties were used to measure economic interdependences of the selected sectors in the Mississippi food economy. IMPLAN is one of the most widely used input-output models in the nation (Lindall and Olson n.d.). IMPLAN is a nationally recognized modeling system based on county-level data and is of sufficient depth and breadth of detail to be valuable in the analysis of a specific industry's importance in an economy (Hamed 1994).

However, caution must be taken when using the input-output model to analyze the impacts of natural disasters, because these events may cause significant structural changes to the local economy. Regional multipliers reflect the industry linkages in a local economy at a given time, and so are best used to study less-catastrophic events where those linkages are for the most part preserved (BEA 2005). In the case of Mississippi, the IMPLAN input-output model was deemed an appropriate methodology to use since the damages did not result in major changes to the overall structure of the state's economy.

Estimates of economic losses were incorporated in the model as short-, intermediate-, and long-term effects. These classifications were based on three criteria: insurability, level of destruction, and time needed to replace losses. These data provide enough information to populate the model and measure the direct and induced economic impacts in the industry.

The main sources of data for the analysis were the Mississippi Department of Agriculture and Commerce (MDAC 2005) and the IMPLAN 2003 data set for Mississippi counties. The data on economic losses from MDAC were compiled by experts from the Mississippi State University Agricultural Economics Department (Anderson et al. 2005) and state and federal agencies, and were considered preliminary. Thus the final values of these estimates may have changed from the author's data set.

## Results

The impact of hurricanes Katrina and Rita in Mississippi was much more than the direct impact on the food and fiber industry. To measure the total impact of these two hurricanes on the Mississippi food and fiber industry, the indirect and induced impacts of food and fiber were taken into consideration. Indirect impacts occur when the food and fiber industry purchases goods and services from local businesses. Food and fiber-induced impacts are measured by increases in economic activity to satisfy the personal consumption by employees of the food and fiber industry or by employees of firms that provide inputs to the food and fiber sector. The sum of direct, indirect, and induced food and fiber effects provides a measure for the total economic impact of the food and fiber industry in the state.

## Base Model

The total impact of food and fiber activities on Mississippi's labor income (employee compensation plus proprietor income) was \$16.8 billion in 2003. A summation of the five top earnings impacts were as follows in rank order: (1) food wholesale and retail trade, \$3.5 billion; (2) wood processing (forestry), \$2.7 billion; (3) finance and real estate, \$2.05 billion; (4) construction, \$1.8 billion; and (5) transportation and equipment, \$1.1 billion.

In 2003, \$32.4 billion, or about 86 percent of all wages, went to workers in non-food and fiber enterprises. Within the food and fiber industry, employees in the poultry and eggs, cattle, cotton, tobacco, processed meat and eggs, dairy processing, miscellaneous food processing, grain and flour milling, fats and oil processing, soft drinks and liquor, fabric and paper processing, food wholesale and retail, food service, and wholesale and retail trade sectors received more than \$1.28 billion, or 13.72 percent, of wages generated. This paper presents aggregated results from the 23-sectoring scheme in the model. However, detail results for these sectors are available upon requests from the authors.

The impact of food and fiber on business expenses in the state totaled \$17.25 billion, or nearly 39.5 percent of all expenses. Within the agricultural sectors poultry and eggs, cattle, cotton, tobacco, processed meat and eggs, dairy processing, miscellaneous food processing, grain and flour mill-

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**Table 1. Aggregation Scheme For Input-Output Analysis of Hurricanes Katrina and Rita Impact on Mississippi Food and Fiber Industry, 2005.**

Aggregated Sector	IMPLAN Sectors
Farm inputs & machinery	Prepared feeds, N.E.C; nitrogenous and phosphatic fertilizer; fertilizers, mixing only; agricultural chemicals, N.E.C; farm machinery and equipment; lawn and garden equipment
Ag/forest/fishing service	Agricultural, forestry, fishery services; commercial fishing
Dairy Farm Products	Dairy farm products
Poultry and eggs	Poultry and eggs
Cattle	Ranch fed cattle; range fed cattle; cattle feedlots
Other livestock	Sheep, lambs and goats; other meat animal products; miscellaneous livestock
Hogs, pigs and swine	Hogs, pigs and swine
Cotton	Cotton
Grain	Food grains; feed grains
Other crops	Hay and pasture; fruits; tree nuts; vegetables
Tobacco	Tobacco
Oil bearing crops	Peanuts, soybeans
Horticulture/nursery	Grass seeds; greenhouse and nursery products; landscape and horticultural services
Forest products	Forest products
Processed meat/eggs	Meat packing plants; sausages and other prepared meats; poultry processing
Dairy processing	Creamery butter; cheese, natural and processed; condensed and evaporated milk; ice cream and frozen desserts; fluid milk
Misc. food processing	Canned specialties; canned fruits and vegetables; dehydrated food products; pickles, sauces, and salad dressing; frozen fruits, juices and vegetables; frozen specialties; dog, cat, and other pet food; bread, cake, and related products; cookies and crackers; sugar; confectionery products; chocolate and Cocoa products; chewing gum; salted and roasted nuts & seeds; canned and cured sea foods; prepared fresh or frozen fish; roasted coffee; potato chips & similar snacks; manufactured Ice; macaroni and spaghetti; food preparations, N.E.C; cigarettes; cigars; chewing and smoking tobacco; tobacco stemming and redrying
Grain/flour milling	Flour And Other Grain Mill Prod.; Cereal Preparations; Rice Milling; Blended And Prepared Flour; Wet Corn Milling
Fats & oils processing	Cottonseed Oil Mills; Soybean Oil Mills; Vegetable Oil Mills, N.E.C; Animal And Marine Fats And Oils; Shortening And Cooking Oils
Soft drinks & liquor	Malt Beverages; Malt; Wines, Brandy, And Brandy Spirits; Distilled Liquor, Except Brandy; Bottled And Canned Soft Drinks; Flavoring Extracts And Syrups

**Table 1. Aggregation Scheme For Input-Output Analysis of Hurricanes Katrina and Rita Impact on Mississippi Food and Fiber Industry, 2005 (Continued).**

Aggregated Sector	IMPLAN Sectors
Fabric mills and leather	Broadwoven Fabric Mills And Finishing; Narrow Fabric Mills; Thread Mills; Textile Goods, N.E.C; Leather Tanning And Finishing; Leather Gloves And Mittens; Personal Leather Goods; Leather Goods, N.E.C.
Wood and paper processing	Logging Camps And Logging Contractors; Sawmills And Planing Mills; Hardwood Dimension And Flooring; Special Product Sawmills, N.E.C; Millwork; Wood Kitchen Cabinets; Veneer And Plywood; Structural Wood Members, N.E.C; Wood Containers; Wood Pallets And Skids; Mobile Homes; Prefabricated Wood Buildings; Wood Preserving; Reconstituted Wood Products; Wood Products, N.E.C; Pulp Mills; Paper Mills, Except Building Paper; Paperboard Mills; Paperboard Containers And Boxes; Paper Coated & Laminated Packaging; Paper Coated & Laminated Nec; Bags, Paper; Die-cut Paper And Board; Sanitary Paper Products; Envelopes; Stationery Products; Converted Paper Products, N.E.C
Food wholesale & retail	Food Wholesale and Retail
Food service	Restaurant; Institutions
Mining	Iron Ores; Copper Ores; Lead And Zinc Ores; Gold Ores; Silver Ores; Ferroalloy Ores, Except Vanadium; Metal Mining Services; Uranium-radium-vanadium Ores; Metal Ores, Not Elsewhere Classified; Coal Mining; Natural Gas & Crude Petroleum; Natural Gas Liquids; Dimension Stone, Sand And Gravel; Clay, Ceramic, Refractory Minerals; Potash, Soda, And Borate Minerals; Phosphate Rock; Chemical, Fertilizer Mineral Mines; Nonmetallic Minerals; Misc. Nonmetallic Minerals, N.E.C.
Construction	New Residential Structures; New Industrial And Commercial Buildings; New Utility Structures; New Highways And Streets; New Farm Structures; New Mineral Extraction Facilities; New Government Facilities; Maintenance And Repair, Residences; Maintenance And Repair Other Facilities; Maintenance And Repair Oil And Gas Wells
Petroleum & chemicals	Alkalies & Chlorine; Industrial Gases; Inorganic Pigments; Inorganic Chemicals Nec.; Cyclic Crudes, Interm. & Indus.; Plastics Materials And Resins; Synthetic Rubber; Cellulosic Man-made Fibers; Organic Fibers, Noncellulosic; Drugs; Soap And Other Detergents; Polishes And Sanitation Goods; Surface Active Agents; Toilet Preparations; Paints And Allied Products; Gum And Wood Chemicals; Adhesives And Sealants; Explosives; Printing Ink; Carbon Black; Chemical Preparations, N.E.C; Petroleum Refining; Paving Mixtures And Blocks; Asphalt Felts And Coatings; Lubricating Oils And Greases; Petroleum And Coal Products, N; Tires And Inner Tubes; Rubber And Plastics Footwear; Rubber And Plastics Hose And Belting; Gaskets, Packing And Sealing; Fabricated Rubber Products, N.E; Miscellaneous Plastics Products
Trans & comm services	Railroads And Related Services; Local, Interurban Passenger Trains; Motor Freight Transport And Warehousing; Water Transportation; Air Transportation; Pipe Lines, Except Natural Gas; Arrangement Of Passenger Transp.; Transportation Services; Communications, Except Radio And TV; Radio And Tv Broadcasting



**Table 1. Aggregation Scheme For Input-Output Analysis of Hurricanes Katrina and Rita Impact on Mississippi Food and Fiber Industry, 2005 (Continued).**

Aggregated Sector	IMPLAN Sectors
Misc. Mfg.	Womens Hosiery, Except Socks; Hosiery, N.E.C; Knit Outerwear Mills; Knit Underwear Mills; Knit Fabric Mills; Knitting Mills, N.E.C; Yarn Mills And Finishing Of Textiles; Carpets And Rugs; Coated Fabrics, Not Rubberized; Tire Cord And Fabric; Nonwoven Fabrics; Cordage And Twine; Apparel Made From Purchased Materials; Curtains And Draperies; House furnishings, N.E.C; Textile Bags; Canvas Products; Pleating And Stitching; Automotive And Apparel Trimming; Schiffi Machine Embroideries; Fabricated Textile Products, N.; Wood Household Furniture; Upholstered Household Furniture; Metal Household Furniture; Mattresses And Bedsprings; Wood Tv And Radio Cabinets; Household Furniture, N.E.C; Wood Office Furniture; Metal Office Furniture; Public Building Furniture; Wood Partitions And Fixtures; Metal Partitions And Fixtures; Blinds, Shades, And Drapery; Furniture And Fixtures, N.E.C; Newspapers; Periodicals; Book Publishing; Book Printing; Miscellaneous Publishing; Commercial Printing; Manifold Business Forms; Greeting Card
Utility services	Electric Services; Gas Production And Distribution; Water Supply And Sewerage Systems; Sanitary Services And Steam Supplies
Wholesale & retail trade	Wholesale Trade; Building Materials & Gardening; General Merchandise Stores; Automotive Dealers & Service Stores; Apparel & Accessory Stores; Furniture & Home Furnishings Stores; Miscellaneous Retail
Financial/real estate	Banking; Credit Agencies; Security And Commodity Brokers; Insurance Carriers; Insurance Agents And Brokers; Owner-occupied Dwellings; Real Estate
Misc. Services	Hotels And Lodging Places; Laundry, Cleaning And Shoe Repair; Portrait And Photographic Studios; Beauty And Barber Shops; Funeral Service And Crematories; Miscellaneous Personal Services; Advertising; Other Business Services; Photo finishing, Commercial Photos; Services To Buildings; Equipment Rental And Leasing; Personnel Supply Services; Computer And Data Processing; Detective And Protective Service; Automobile Rental And Leasing; Automobile Parking And Car Wash; Automobile Repair And Services; Electrical Repair Service; Watch, Clock, Jewelry And Furniture; Miscellaneous Repair Shops; Child Day Care Services; Social Services, N.E.C.; Residential Care; Other Nonprofit Organizations; Business Associations; Labor And Civic Organizations; Religious Organizations; Engineering, Architectural Serv; Accounting, Auditing And Bookkeeping; Management And Consulting Service; Research, Development & Testing; Legal Services
Health services	Doctors And Dentists; Nursing And Protective Care; Hospitals; Other Medical And Health Service
Balance	Noncomparable Imports; Scrap; Used And Secondhand Goods; Rest Of The World Industry; Inventory Valuation Adjustment

ing, fats and oil processing, and fabric and paper processing businesses accounted for \$4.14 billion in business expenses, or about 23.98 percent of all expenses generated in the state's economy. In terms of business revenues, these 10 sectors accounted for about \$19.54 billion of the state's total revenues.

*Temporal Effects*

Table 2 provides a summary of the temporal effects of hurricanes Katrina and Rita on the Mississippi food and fiber industry and the state's economy.

The short-term impacts were small, primarily because the economic shocks had not worked their way through the system. The results suggested that business revenues in the food and fiber industry could decline more than \$38.7 million during the first year after the hurricanes, while business revenues statewide could decline \$44.29 million. The model suggests that labor income could decline \$4.4 million and \$6.02 million, respectively, in the food and fiber industry and state economy during this period. The results further suggested that food and fiber expenses could decline almost \$4.37 million, while business expenses statewide could decline almost \$6.02 million during the first year after hurricanes Katrina and Rita. The model projects that income from other property sources in the food and fiber industry in Mississippi could decline almost \$9.5 million. Adding this figure to the impact in the rest of the state suggests that other property income could decline more than \$10.6 million in the first year after the hurricanes in Mississippi. The impact on food and fiber employment was nil, declining by 217 jobs, versus 282 jobs statewide. In terms of contributions to the state's gross domestic product, the model projects that value-added from food and fiber could decline more than \$14.4 million immediately after the hurricanes. Statewide, this figure will rise to almost \$17.5 million during this period.

The intermediate (three- to seven-year) effects of these disasters on the food and fiber industry and the state's economy are more significant because the economic shocks of the disasters should have begun to manifest themselves in the state. Under this scenario, the results suggest that food and fiber revenues could decline more than \$1.5 billion, while business revenues statewide would decline more than \$2 billion during the next three to seven years after the hurricanes. The model suggests that labor

income could decline almost \$272.4 million and \$489.85 million in the food and fiber industry and the state economy, respectively, during this period. The results also suggest that food and fiber expenses could decline about \$234 million, while business expenses statewide could decline almost \$425.3 million during the intermediate years after Katrina and Rita. Income from other property is projected to decline almost \$383 million in the food and fiber industry in Mississippi. Adding this figure to the impact in the rest of the state suggests that other property income could decline almost \$452 million in the first three to seven years after the hurricanes in Mississippi. In terms of contributions to the state's gross domestic product, the model-projected total value-added from the food and fiber industry could decline more than \$697.4 million during the next three to seven years after the hurricanes. Statewide, this figure will rise more than \$998.5 million during this period.

The long-term impacts are similar to the intermediate-term effects, but there were some differences. Food and fiber revenues are projected to increase more than \$261 million but will still decline almost \$1.3 billion in the long term. Business revenues statewide will improve significantly, increasing more than \$177 million during this period, for a net loss of almost \$1.9 billion (see Table 2). The results suggest that food and fiber expenses would decline more than \$34.26 million to \$199.79 million. Statewide, business expense losses will rise significantly from \$425.37 million to almost \$497 million for a net increase of \$71.66 million in the long term.

The model suggests that labor income in the food and fiber industry would experience significant gains, increasing by \$41.43 million, for a net loss of \$231.12 million over the next 10 to 15 years. Statewide, labor income is projected to rise an additional \$93.5, million for a total reduction of \$583.4 million during this period. Because much of the property losses were in crops, timber, and poultry industries, the model projects that food and fiber income from other property sources would rise more than \$131.82 million for a net loss of \$321.58 million over the intermediate-term scenario in Mississippi. Adding this figure to the impact in the rest of the state suggested that other property income in Mississippi could decline almost \$324 million over the next 15 years due to these hurricanes. In terms of

Table 2. Net Change in Food and Fiber and Mississippi Economies Due To Hurricanes Katrina and Rita.

Scenario	Employment	Business revenues	Business expenses	Labor income	Other property income	Total value added
<b>Base model</b>						
Food and fiber Industry	608,527	\$56,812	\$16,179	\$16,796	\$7,012	\$25,140
Mississippi	1,443,566	125,857	43,673	43,529	17,397	65,594
<b>Short run</b>						
Food and fiber Industry	(217)	(38,705,725)	(4,209,079)	(4,371,395)	(9,521,101)	(14,420,391)
Mississippi	(282)	(44,292,219)	(5,788,818)	(6,015,489)	(10,642,888)	(17,479,574)
<b>Intermediate run</b>						
Food and fiber Industry	(20,533)	(1,499,529,716)	(234,054,671)	(272,385,185)	(382,081,552)	(697,403,313)
Mississippi	(31,021)	(2,054,305,489)	(425,282,479)	(489,855,544)	(451,875,077)	(998,527,237)
<b>Long run</b>						
Food and fiber Industry	(6,968)	(1,280,650,192)	(199,788,251)	(231,122,498)	(319,707,235)	(615,427,274)
Mississippi	(21,957)	(1,877,070,384)	(496,946,119)	(583,356,722)	(323,687,632)	(984,239,074)

Source: Summarized from Appendix B, Tables 1 through 4, which are not included here but are available on request from the authors.

contributions to the state's gross domestic product, the model-projected total value-added from food and fiber activities could increase about \$92 million, for a net loss of \$606.46 million over the long run. Statewide, total value-added will rise about \$14.3 million during this same period. Despite this, total value-added is projected to decline \$984.2 million over the next 15 or so years. Compared to 2005, this would be about 1.02 percent of gross domestic product in Mississippi.

#### Summary

The broad impacts of hurricanes Katrina and Rita on the food and fiber industry are reflected in the 23 sectors and the distribution of selected indicators in the Mississippi economy. The combined impact of these disasters is projected to reduce business revenues from food and fiber and related industries by almost \$1.9 billion over the next 15 years in Mississippi. Employment is expected to decline by 21,957 jobs in food and fiber and related industries,

or 1.52 percent of total employment in the state, during this period. Of this, 6,968 jobs, or 31.73 percent, are projected to occur in the food and fiber industry during this period.

The impact of hurricanes Katrina and Rita on labor income is projected to exceed \$583.35 million in losses statewide. Of this, more than \$231.12 million will come from labor income in the food and fiber industry. Dividing workers' portion of labor income (\$583,356,722) by the number of lost jobs (21,957) suggests the average earnings potential of those employees would be about \$26,568 annually.

The impact of hurricanes Katrina and Rita on indirect business taxes is expected to reduce these costs by more than \$60.2 million in the food and fiber industry and by a total of \$77 million statewide in the long run. Income losses from other real and personal property are projected to decline \$324 million during the coming years. Public finances to local and state governments are projected to decline almost \$183 million during the next 15 years (Table 3).

Table 3. Potential Impact of Hurricanes Katrina and Rita on Tax Receipts in Mississippi.

Tax Item	Short run	Intermediate run	Long run	Total
Corporate profits tax	\$(108,266)	\$(4,596,772)	\$(3,292,764)	\$(7,997,802)
Dividends	(417,654)	(17,732,708)	(12,702,312)	(30,852,674)
Indirect business tax				
Sales	(461,266)	(31,902,680)	(43,360,298)	(75,724,244)
Property	(206,767)	(14,300,673)	(19,436,657)	(33,944,097)
Other	(66,998)	(4,633,824)	(6,298,028)	(10,998,850)
Personal				
Income	(76,119)	(6,238,846)	(7,450,992)	(13,765,958)
Motor vehicle license	(8,730)	(715,474)	(854,470)	(1,578,674)
Fishing and hunting	(2,791)	(228,734)	(273,166)	(504,690)
Property	(2,595)	(212,667)	(253,993)	(469,255)
Fees and fines (non tax)	(16,030)	(1,313,887)	(1,569,168)	(2,899,085)
Social security insurance contribution				
Employee	(6,628)	(491,637)	(560,036)	(1,058,301)
Employer	(18,014)	(1,336,245)	(1,522,150)	(2,876,410)
Total	(1,391,859)	(83,704,147)	(97,574,036)	(182,670,041)

Note: Other indirect business taxes include: motor vehicle license, other taxes, state & local (S/L) non taxes and severance tax.



Table 4 provides a summary of the projected impacts of hurricanes Katrina and Rita on Mississippi food and fiber in the short, intermediate, and long terms in percentage reductions among key economic indicators. For example, the results show that food and fiber employment is projected to decline about 0.0048 percent during the next five to 15 years. Food and fiber and related industries' business revenues are projected to decline 1.02 percent in the long term, while business expenses are projected to decline almost 0.0046 percent during this same period. Labor income is projected to decline 0.0053 percent, value-added 0.0094 percent, and other property income 1.84 percent in this industry. Statewide, employment is projected to decline 1.52 percent, business revenues 1.49 percent, business expenses 1.14 percent, labor income 1.34 percent, other property income 1.86 percent, and value-added 1.50 percent. On average, economic activity is projected to decline about 1.47 percent in the long term.

Conclusion

Although the food and fiber industry contributes a tremendous amount to Mississippi's economy through value-added and related industries and plays a vital role in encouraging community and economic development in rural areas, this study projects some rough economic times may lie ahead in the coming years for this industry. According to Table 1, which is based on the 2003 IMPLAN data, food and fiber and related industries accounted for about 47.8 percent of the state's total revenues. Over the next several years, this figure is projected to decline by 1.49 percent to 43.6 percent of the state's total revenues. In fact, the authors project economic downturns in all the key indicators in the study. Although the state ended fiscal year 2006 with a \$70 million surplus, Mississippi's governor admitted that no one knows how much of this sur-

plus resulted from the significant federal subsidies poured into the state in 2005 and 2006. However, if the state can quickly complete the clean-up and reconstruction phases, it may hasten the day of its recovery and limit the long-term economic impact of hurricanes Katrina and Rita. Only time will tell if the authors' projections are correct.

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Table 4. Percent Change in Food and Fiber and Mississippi Economy Due To Hurricanes Katrina and Rita.

Scenario	Employment	Business revenues	Business expenses	Labor income	Other property income	Total value added
Base model						
Food and fiber Industry	0.422	0.451	0.37	0.364	0.403	0.383
Mississippi						
Short run						
Food and fiber Industry	(0.000151)	(0.000308)	(0.000096)	(0.0000100)	(0.000547)	(0.000220)
Mississippi	(0.00020)	(0.00035)	(0.00013)	(0.00014)	(0.00061)	(0.00027)
Intermediate run						
Food and fiber Industry	(0.01424)	(0.01191)	(0.00536)	(0.00626)	(0.02200)	(0.01063)
Mississippi	(0.02149)	(0.01632)	(0.00974)	(0.01125)	(0.025977)	(0.01522)
Long run						
Food and fiber Industry	(0.00483)	(0.01018)	(0.00457)	(0.00531)	(0.01838)	(0.00925)
Mississippi	(0.01521)	(0.01491)	(0.001138)	(0.01340)	(0.01861)	(0.01501)

Source: Derived from results in Table 3.