



FORESTRY IN MISSISSIPPI

*The Impact of the Industry on the Mississippi Economy;
An input-output analysis*

BASED ON 2010 DATA • FOREST AND WILDLIFE RESEARCH CENTER • MISSISSIPPI STATE UNIVERSITY

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FOREST AND WILDLIFE RESEARCH CENTER

Mississippi State University

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TABLE OF CONTENTS

Introduction.....	1
Methods.....	2
Results.....	3
Logging.....	4
Solid Wood Products.....	4
Pulp and Paper.....	5
Wood Furniture.....	5
Total Industry Impact.....	6
Impacts of the 2007 Recession and the Collapse of the Housing Market.....	6
Literature Cited.....	8
Tables.....	10

INTRODUCTION

Forest resources are a major economic asset in Mississippi covering about 19.7 million acres, (65%) of the total land area (Oswalt and Bentley 2011). Mississippi's forests provide a range of services including recreation, tourism, raw materials, and environmental benefits, which all contribute to the state's welfare. Over \$1.1 billion worth of timber is harvested annually for the forest products industry, one of the most important components of the State's economy (Henderson 2008). In 2008, the total forest industry impact on Mississippi's economy was about \$17.4 billion (Henderson et al. 2008).

The forest products industry—firms that use forest products for raw materials—includes four main sectors: logging, solid wood products, pulp and paper, and wood furniture manufacturing. Its impact on Mississippi's economy is measured by four key statistics: 1) employment—the number of full- and part-time jobs in the sector; 2) employee compensation—the wages paid by the sector; 3) output—the sector's total value of production; and 4) value-added—total sector output minus the costs of purchased inputs. Value-added represents the amount of money available for disbursement, either in the form of wages, owner compensation, or taxes.

The forest products industry impacts Mississippi's economy in three ways: direct, indirect, and induced impacts. Direct impacts are brought about by the sector's own employment, wages, production and value-added. Indirect impacts are the result of the industry's purchase of goods and services from supporting industries in the state and result in increases in all four key statistics at the economy level. Lastly, induced impacts are the result of purchases of goods and services by employees of the forest products and other supporting industries.

Forest resources impact the economy at all levels, from wages and purchases in local economies to state-level payroll and income taxes. Therefore, there is a multi-level interest in impacts of the forest product industry, from local producers to elected officials. This study evaluates the importance of the forest products industry to the state's economy.



METHODS

The economic impacts of the forest products industry in Mississippi were modeled using the Impact Analysis for Planning (IMPLAN) system. Primary data were collected from Minnesota IMPLAN Group, Inc., of Stillwater, Minnesota. IMPLAN was originally developed by the USDA Forest Service in cooperation with the Federal Emergency Management Agency and the USDI Bureau of Land Management to assist the Forest Service in land and resource management planning (MIG 2004). It is a non-survey-based computer software and modeling system for constructing regional economic accounts and regional input-output tables at flexible spatial scales (Shaffer et al. 2004, Tilley and Munn 2007). 2010 IMPLAN data, the most recent available, were used to construct the model. Output is reported in 2010 dollars.

This study combined the 440 sectors into 31 aggregated sectors—4 major forest products sectors, 1 sector of miscellaneous forestry related activities, and 26 non-forestry related sectors (Table 1). This procedure follows Barnett and Reinschmidt (1996) who modeled the Mississippi economy using 44 aggregated sectors—26 food and fiber sectors and 18 non-food and non-fiber sectors. The focus of this study was the forest products industry; therefore, the non-forestry related food and fiber sectors were further aggregated into three sectors: agricultural production, agricultural processing, and food processing.

This study estimated the economic impact of each of the four primary sectors of the forest products industry and of the industry as a whole. Direct impacts were determined using IMPLAN data, except for total output of the logging sector. Output data for this sector is measured annually by the Mississippi State University Extension Service (Henderson 2011) and was used in this study.

Total impacts (direct, indirect, and induced) were computed in the IMPLAN model by removing total employment for each relevant sector and calculating the impact on the state economy resulting from the total loss of industry production from that sector. This is the procedure recommended by the Minnesota IMPLAN Group (2000) to estimate the economic impact of an industry.

RESULTS

The direct impacts of the industry aggregations used in this study on Mississippi's economy are provided in Table 2. Employment, wages and salaries, output, and value-added are reported for each industry aggregation. The forest products industry (all forest-related sectors) employed 36,130 people in 2010, 2.42% of the state's total employment of 1,492,066. The industry paid out over \$1.63 billion in wages. The industry's average annual wage was \$45,183; \$5,897 more than the state average. Value-added generated by the industry totaled over \$2.43 billion.

Estimates of the direct, indirect, and induced impacts of the logging, solid wood products, wood furniture, and pulp and paper sectors, on the state economy are provided in Tables 3, 4, 5, and 6, respectively. Total impacts are reported by aggregated sectors. In general, the impacts reported for forest related sector are direct impacts while the impacts reported for all other sectors are indirect and induced impacts. The total impact of the sector on the state economy is summarized in the table row titled Total Sectors.

Estimates of the total impacts of the aggregated forest-related sectors are provided in Table 7. Summing the impacts of the individual forest-related sectors analyzed separately overestimates the impacts of the forest products industry. Considered separately, each sector has indirect and induced impacts on the other forest-related sectors. However, when all forest-related sectors are considered as a group, these impacts are internal and thus do not result in additional indirect or induced impacts. Aggregating the forest-related sectors allows IMPLAN to automatically internalize these impacts and generate a more precise impact of the industry on the state economy.



LOGGING



According to the North American Industrial Classification System (NAICS), the logging sector includes establishments primarily engaged in one or more of the following: (1) cutting timber; (2) cutting and transporting timber; and (3) producing wood chips in the field. Logging is the chief source of raw materials to all other forest products industry and it also makes a significant contribution to Mississippi's economy through its own employment and income generation.

Timber is one of Mississippi's most valuable crops. In 2010, the value of Mississippi's timber harvest at the point of first processing was \$1.04 billion, and landowners received \$545.36 million for their standing timber (Henderson 2011). The direct impact of the industry was significant. Logging firms employed 5,734 people and paid \$244.35 million in wages and salaries. Value-added was \$239.28 million (Table 2). In 2010, the total economic impact generated by logging sector amounted to **10,474 jobs** with wages totaling \$419.05 million (Table 3). Additionally, logging generated approximately **\$1.53 billion of Mississippi's total industry output** and \$512.74 million value-added to Mississippi's economy. Based on employment, the sectors that benefited the most from the indirect and induced impacts created by the logging sector were miscellaneous services, resource services, wholesale and retail trade, and miscellaneous manufacturing. However, the sector's overall importance was much greater than stated here. Logging provides the necessary raw material for the other primary sectors (solid wood products, pulp and paper, and wood furniture manufacturing) of the forest products industry in the state.

SOLID WOOD PRODUCTS



Another major sector of Mississippi's forest product industry is the solid wood products sector, which includes sawmills and wood preservation, veneer and plywood manufacturing, engineered wood member and truss manufacturing, reconstituted wood product manufacturing, wood container and pallet manufacturing, prefabricated wood building manufacturing, all other miscellaneous wood product manufacturing, and custom architectural wood work and millwork manufacturing (Table 1). In 2010, the solid wood products sector directly employed 8,443 workers and paid \$391.06 million in wages and salaries. The average annual wage

was \$46,318 — \$7,032 higher than the state average. Total industry output for the solid wood products sector was \$1.71 billion and the value-added was \$541.64 million (Table 2).

The solid wood products sector utilized 947.99 million board feet of pine stumpage and 318.71 million board feet of hardwood stumpage in 2010, resulting in payments to Mississippi landowners of \$343.31 million (Henderson 2011). In 2010, **17,321 jobs** were generated by this sector with wages of \$ 727.79 million. Total industry output and value-added was **\$2.73 billion** and \$1.04 billion, respectively (Table 4).

PULP & PAPER



The pulp and paper sector includes pulp mills, paper mills, paperboard mills, paperboard container manufacturing, coated and laminated paper, packaging paper and plastic film manufacturing, all other paper bag and coated and treated manufacturing, sanitary paper product manufacturing, and all other converted paper product manufacturing (Table 1). In 2010, these firms employed 3,623 workers and paid \$309.24 million in wages and salaries. The average annual wage was \$85,355 which was \$46,069 higher than the state average. Total industry output for this sector was \$2.06 billion and the value-added was \$616.42 million (Table 2). The pulp and paper sector utilized 5.08 million

cords of pine pulpwood and 1.56 million cords of hardwood pulpwood in 2010, resulting in payments to Mississippi landowners of \$201.05 million (Henderson 2011). The number of full-and part-time jobs generated by this sector through direct, indirect, and induced impacts was 10,875 with total wages of about \$592.82 million. **Total industry output was \$2.90 billion** and \$1.06 billion value-added to Mississippi's economy (Table 6).

WOOD FURNITURE



The wood furniture sector is the largest sector of the forest products industry, and it has the greatest impact on Mississippi's economy among the four primary forest products sectors. This sector includes wood windows and door and millwork manufacturing, wood kitchen cabinet and countertop manufacturing, upholstered and non-upholstered wood furniture manufacturing, and office furniture (Table 1). In 2010, this sector employed 17,882 workers and paid \$654.90 million in wages and salaries. The average annual wage was \$36,623 which was \$2,663 lower than the state average. Total industry output for this sector was \$2.65 billion and the value-added was \$937.44

million (Table 2). Total employment (direct, indirect, and induced) generated by the wood furniture sector was 28,867 with total wages of \$1.06 billion. Total industry output and value-added was **\$3.85 billion** and \$1.55 billion, respectively (Table 5).

TOTAL INDUSTRY IMPACT

The forest products industry accounts for approximately 50% of the total impacts due to food and fiber-related production and processing (Barnett and Reinschmiedt 1996). In 2010, the total combined impact of forestry-related employment (direct, indirect, and induced) was about 4.25% of all jobs in Mississippi. The average annual wage in forestry-related occupations was \$45,183; \$5,897 more than the state average (Table 2).

In Mississippi, total industry output related to the forest product industry was \$10.38 billion and related value-added was \$3.95 billion. Similarly, related total employment was 63,365 jobs with \$2.63 billion in wages and salaries (Table 7).

IMPACTS OF THE 2007 RECESSION AND THE COLLAPSE OF THE HOUSING MARKET

The performance of the forest products industry is very sensitive to the performance of the economy as a whole, typically doing better than the economy as a whole during good times, and conversely, doing worse than the economy as a whole during bad times. Solid wood products, particularly softwood lumber, are a primary raw material for new construction in general and the housing market in particular. Wood furniture, particularly wood cabinets, is also closely linked to the housing market. Packaging (i.e., corrugated boxes, bags, fiber drums) is closely tied to the level of shipments of finished goods. Thus, the pulp and paper sector also tracks the overall economy. Because of these close ties with the general strength of the economy, the forest products industry has suffered through the 2007 recession. The impact of this recession has been particularly hard on the solid wood products sector in Mississippi because of its links to the housing market.

Prior to 2007, the forest products industry in Mississippi was faring well. Total value of shipments and value-added had increased over the previous decade. Wages increased despite a decrease in employment resulting from investment in labor-saving equipment. From 1998 (Munn and Henderson 2002) to 2006 (Henderson et al. 2008), wages and salaries, total industry output and value added increased by 11.13%, 17.7% and 18.5% respectively while direct employment decreased by 20.7%. Total effects mirrored the direct effects with total employment decreasing by 18.5% while wages and salaries, total industry output, value-added increased by 2.0%, 17.4% and 9.2%. The wage differential between forest industry employees and the rest of the state employees increased from \$5,820 to \$8,777 from 1998 to 2006.

After 2006, the forest products industry in Mississippi was severely impacted by the recession and housing slump. The magnitude of the impact is illustrated by the changes in the direct effects between 2006 and 2010. Employment decreased 29.6%. Wages and salaries, total industry output and value added decreased by 21.8%, 27.5% and 30.6%, respectively (Fig.1). The wage premium for forest products workers compared to the state average decreased from \$8,777 in 2006 to \$5,897 in 2010. Changes in total effects were even more dramatic. From 2006 to 2010, total employment related to the forest products industry decreased 48.8%. Wages and salaries, total industry output and value-added decreased by 39.8%, 40.3% and 44.6% respectively.

As a percentage of the state's total economy, the contribution of the forest products industry has decreased substantially since 2006. In 2006, employment, wages and salaries, total industry output, and value-added accounted for 8.3%, 9.2%, 10.1%, and 9.4% of the state's totals, respectively (Fig. 2). By 2010, these contributions had decreased to 4.3%, 4.5%, 5.8%, and 4.7%, respectively. These values illustrate how the recession has had a greater impact on the forest products industry compared to other sectors of the state's economy. Nonetheless, the forest products industry remains an important component of Mississippi's economy even though it has experienced significant contractions over the past decade. The housing market is projected to recover by 2014-15. Along with a general improvement in the economy, such a recovery will return the forest products industry to a more substantial component of Mississippi's economy.



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FIGURE 1. DIRECT IMPACTS OF MISSISSIPPI'S FOREST PRODUCTS INDUSTRY OVER TIME

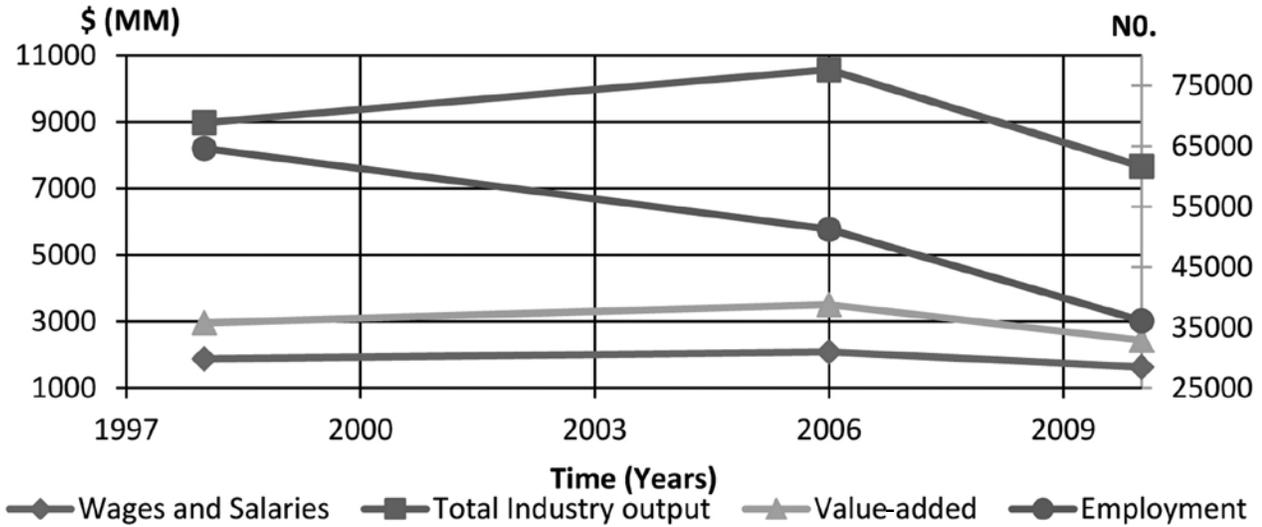
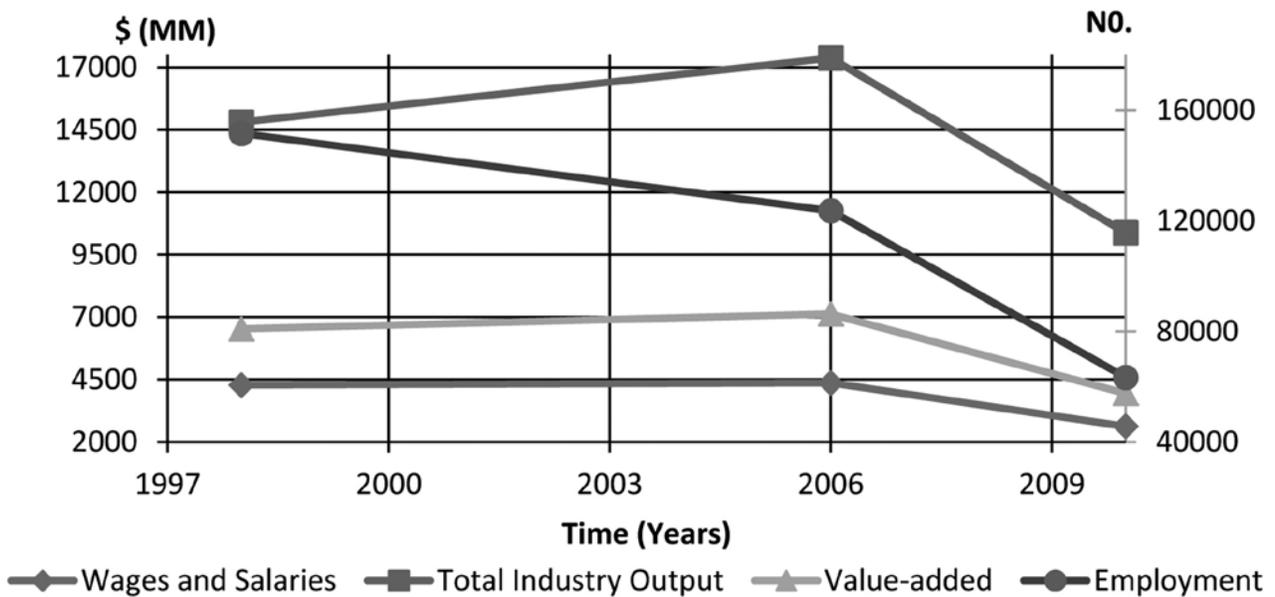


FIGURE 2. TOTAL IMPACTS OF MISSISSIPPI'S FOREST PRODUCTS INDUSTRY OVER TIME.



I. AGGREGATION SCHEME OF COMMERCIAL SECTORS USED FOR IMPLAN INPUT-OUTPUT ANALYSIS OF THE FOREST PRODUCTS INDUSTRY IMPACTS ON THE MISSISSIPPI ECONOMY, 2010.

MODEL SECTORS	ORIGINAL IMPLAN SECTORS
MISCELLANEOUS FOREST PRODUCTS	Forestry, forest products, and timber tract production(15)
LOGGING	Commercial logging (16)
SOLID WOOD PRODUCTS	Sawmills and wood preservation(95); Veneer and plywood manufacturing(96); Engineered wood member and truss manufacturing(97); Reconstituted wood product manufacturing(98); Wood container and pallet manufacturing(100); Prefabricated wood building manufacturing(102); All other miscellaneous wood product manufacturing(103); Custom architectural woodwork and millwork manufacturing(301)
WOOD FURNITURE	Wood windows and doors and millwork manufacturing(99); Wood kitchen cabinet and countertop manufacturing(295); Upholstered household furniture manufacturing(296); Nonupholstered wood household furniture manufacturing(297); Office furniture (300)
PULP AND PAPER	Pulp mills(104); Paper mills(105); Paperboard Mills(106); Paperboard container manufacturing(107); Coated and laminated paper, packaging paper and plastics film manufacturing (108); All other paper bag and coated and treated paper manufacturing(109); Sanitary paper product manufacturing(111); All other converted paper product manufacturing(112)
RESOURCE SERVICES	Commercial Fishing(17); Commercial hunting and trapping(18); Support activities for agriculture and forestry(19)
MINING	Extraction of oil and natural gas(20); Mining coal(21); Mining iron ore(22);Mining copper, nickel, lead, and zinc(23); Mining gold, silver, and other metal ore(24);Mining and quarrying stone(25); Mining and quarrying sand, gravel, clay, and ceramic and refractory minerals(26); Mining and quarrying other nonmetallic minerals(27); Drilling oil and gas wells(28); Support activities for oil and gas operations(29); Support activities for other mining(30)
CONSTRUCTION	Construction of new nonresidential commercial and health care structures(34); Construction of new nonresidential manufacturing structures(35); Construction of other new nonresidential structures(36); Construction of new residential permanent site single- and multi-family structures(37); Construction of other new residential structures(38); Maintenance and repair construction of nonresidential structures(39); Maintenance and repair construction of residential structures(40)
AGRICULTURAL PRODUCTS	Oilseed farming(1); Grain farming(2); Vegetable and melon farming(3); Fruit farming (4); Tree nut farming(5); Greenhouse, nursery, and floriculture production(6); Tobacco farming(7); Cotton farming(8); Sugarcane and sugar beet farming(9); All other crop farming(10); Cattle ranching and farming(11); Dairy cattle and milk production(12); Poultry and egg production(13); Animal production, except cattle and poultry and eggs(14)
AGRICULTURE PROCESSING	Dog and cat food manufacturing(41); Flour milling and malt manufacturing(43); Wet corn milling(44);Soybean and other oilseed processing(45); Fats and oils refining and blending(46); Breakfast cereal manufacturing(47); Fluid milk and butter manufacturing(55); Cheese manufacturing(56); Dry, condensed, and evaporated dairy product manufacturing(57); Ice cream and frozen dessert manufacturing(58); Animal (except poultry) slaughtering, rendering, and processing(59); Poultry processing(60)

Note: Numbers in the parenthesis are IMPLAN sector numbers.

I. AGGREGATION SCHEME OF COMMERCIAL SECTORS USED FOR IMPLAN INPUT-OUTPUT ANALYSIS OF THE FOREST PRODUCTS INDUSTRY IMPACTS ON THE MISSISSIPPI ECONOMY, 2010 (continued).

FOOD PROCESSING	Sugar cane mills and refining (48); Beet sugar manufacturing(49); Chocolate and confectionery manufacturing from cacao beans(50); Confectionery manufacturing from purchased chocolate(51); Nonchocolate confectionery manufacturing(52); Frozen food manufacturing(53); Fruit and vegetable canning, pickling, and drying(54); Seafood product preparation and packaging (61); Bread and bakery product manufacturing(62); Cookie, cracker, and pasta manufacturing (63); Tortilla manufacturing(64); Snack food manufacturing (65); Coffee and tea manufacturing(66); Flavoring syrup and concentrate manufacturing(67); Seasoning and dressing manufacturing(68); All other food manufacturing(69); Soft drink and ice manufacturing (70); Breweries(71); Wineries(72); Distilleries(73); Tobacco product manufacturing(74)
FARM INPUTS AND MACHINERY	Other animal food manufacturing(42); Fertilizer manufacturing (130); Pesticide and other agricultural chemical manufacturing(131); Farm machinery and equipment manufacturing(203); Lawn and garden equipment manufacturing(204)
FABRIC MILLS AND LEATHER	Fiber, yarn, and thread mills(75); Broadwoven fabric mills(76); Narrow fabric mills and schiffli machine embroidery(77);Textile and fabric finishing mills(80); Leather and hide tanning and finishing (92); Other leather and allied product manufacturing (94)
PETROLEUM AND CHEMICALS	Petroleum refineries(115); Asphalt paving mixture and block manufacturing (116); Asphalt shingle and coating materials manufacturing(117);Petroleum lubricating oil and grease manufacturing(118);All other petroleum and coal products manufacturing(119); Petrochemical manufacturing(120);Industrial gas manufacturing(121); Synthetic dye and pigment manufacturing(122); Alkalies and chlorine manufacturing(123); Carbon black manufacturing(124); All other basic inorganic chemical manufacturing(125);Other basic organic chemical manufacturing(126); Plastics material and resin manufacturing(127); Synthetic rubber manufacturing(128); Artificial and synthetic fibers and filaments manufacturing (129); Medicinal and botanical manufacturing(132); Pharmaceutical preparation manufacturing(133); In-vitro diagnostic substance manufacturing(134); Biological product (except diagnostic) manufacturing(135); Paint and coating manufacturing (136); Adhesive manufacturing(137); Soap and cleaning compound manufacturing(138);Toilet preparation manufacturing (139); Printing ink manufacturing(140); All other chemical product and preparation manufacturing(141); Plastics packaging materials and unlaminated film and sheet manufacturing (142); Unlaminated plastics profile shape manufacturing (143);Plastics pipe and pipe fitting manufacturing(144); Laminated plastics plate, sheet (except packaging), and shape manufacturing (145); Polystyrene foam product manufacturing (146); Urethane and other foam product (except polystyrene) manufacturing(147); Plastics bottle manufacturing (148); Other plastics product manufacturing(149); Tire manufacturing(150); Rubber and plastics hoses and belting manufacturing(151); Other rubber product manufacturing(152)

Note: Numbers in the parenthesis are IMPLAN sector numbers.

I. AGGREGATION SCHEME OF COMMERCIAL SECTORS USED FOR IMPLAN INPUT-OUTPUT ANALYSIS OF THE FOREST PRODUCTS INDUSTRY IMPACTS ON THE MISSISSIPPI ECONOMY, 2010 (continued).

GLASS, STONE, AND CLAY	Pottery, ceramics, and plumbing fixture manufacturing(153); Brick, tile, and other structural clay product manufacturing(154); Clay and nonclay refractory manufacturing(155); Flat glass manufacturing(156); Other pressed and blown glass and glassware manufacturing(157); Glass container manufacturing (158); Glass product manufacturing made of purchased glass (159); Cement manufacturing(160); Ready-mix concrete manufacturing(161); Concrete pipe, brick, and block manufacturing(162); Other concrete product manufacturing(163); Lime and gypsum product manufacturing(164); Abrasive product manufacturing (165);Cut stone and stone product manufacturing(166); Ground or treated mineral and earth manufacturing(167); Mineral wool manufacturing(168); Miscellaneous nonmetallic mineral product manufacturing(169)
METAL INDUSTRIES	Iron and steel mills and ferroalloy manufacturing(170); Steel product manufacturing from purchased steel(171); Alumina refining and primary aluminum production(172); Secondary smelting and alloying of aluminum(173); Aluminum product manufacturing from purchased aluminum(174); Primary smelting and refining of copper(175); Primary smelting and refining of nonferrous metal (except copper and aluminum)(176); Copper rolling, drawing, extruding and alloying(177); Nonferrous metal (except copper and aluminum) rolling, drawing, extruding and alloying (178); Ferrous metal foundries(179); Nonferrous metal foundries(180); All other forging, stamping, and sintering(181); Custom roll forming(182); Crown and closure manufacturing and metal stamping (183); Cutlery, utensil, pot, and pan manufacturing(184); Handtool manufacturing(185); Plate work and fabricated structural product manufacturing(186); Ornamental and architectural metal products manufacturing(187); Power boiler and heat exchanger manufacturing(188); Metal tank (heavy gauge) manufacturing(189); Metal can, box, and other metal container (light gauge) manufacturing(190); Ammunition manufacturing(191); Arms, ordnance, and accessories manufacturing (192); Hardware manufacturing(193); Spring and wire product manufacturing(194); Machine shops(195); Turned product and screw, nut, and bolt manufacturing(196); Coating, engraving, heat treating and allied activities(197); Valve and fittings other than plumbing manufacturing(198); Plumbing fixture fitting and trim manufacturing(199); Ball and roller bearing manufacturing(200); Fabricated pipe and pipe fitting manufacturing(201); Other fabricated metal manufacturing(202)

Note: Numbers in the parenthesis are IMPLAN sector numbers.

I. AGGREGATION SCHEME OF COMMERCIAL SECTORS USED FOR IMPLAN INPUT-OUTPUT ANALYSIS OF THE FOREST PRODUCTS INDUSTRY IMPACTS ON THE MISSISSIPPI ECONOMY, 2010 (continued).

MACHINERY AND EQUIPMENT	<p>Construction machinery manufacturing(205); Mining and oil and gas field machinery manufacturing(206); Other industrial machinery manufacturing(207); Plastics and rubber industry machinery manufacturing (208); Semiconductor machinery manufacturing(209); Vending, commercial, industrial, and office machinery manufacturing(210); Optical instrument and lens manufacturing(211); Other commercial and service industry machinery manufacturing(213); Air purification and ventilation equipment manufacturing(214); Heating equipment (except warm air furnaces) manufacturing (215); Air conditioning, refrigeration, and warm air heating equipment manufacturing(216); Industrial mold manufacturing(217); Metal cutting and forming machine tool manufacturing(218); Special tool, die, jig, and fixture manufacturing(219); Cutting tool and machine tool accessory manufacturing(220); Rolling mill and other metalworking machinery manufacturing(221); Turbine and turbine generator set units manufacturing(222); Speed changer, industrial high-speed drive, and gear manufacturing(223); Mechanical power transmission equipment manufacturing(224); Other engine equipment manufacturing (225); Pump and pumping equipment manufacturing(226); Air and gas compressor manufacturing(227); Material handling equipment manufacturing(228); Power-driven handtool manufacturing (229); Other general purpose machinery manufacturing(230); Packaging machinery manufacturing(231); Industrial process furnace and oven manufacturing(232); Fluid power process machinery manufacturing(233); Electric lamp bulb and part manufacturing (259); Lighting fixture manufacturing(260); Small electrical appliance manufacturing(261); Household cooking appliance manufacturing(262); Household refrigerator and home freezer manufacturing(263); Household laundry equipment manufacturing(264); Other major household appliance manufacturing(265); Power, distribution, and specialty transformer manufacturing (266); Motor and generator manufacturing(267); Switchgear and switchboard apparatus manufacturing (268); Relay and industrial control manufacturing(269); Storage battery manufacturing (270); Primary battery manufacturing(271); Communication and energy wire and cable manufacturing(272); Wiring device manufacturing(273); Carbon and graphite product manufacturing(274); All other miscellaneous electrical equipment and component manufacturing(275)</p>
TRANSPORTATION EQUIPMENT	<p>Automobile manufacturing(276); Light truck and utility vehicle manufacturing(277); Heavy duty truck manufacturing(278); Motor vehicle body manufacturing (279); Truck trailer manufacturing(280); Motor home manufacturing(281); Travel trailer and camper manufacturing(282); Motor vehicle parts manufacturing (283); Aircraft manufacturing(284); Aircraft engine and engine parts manufacturing(285); Other aircraft parts and auxiliary equipment manufacturing(286); Propulsion units and parts for space vehicles and guided missiles manufacturing (288); Railroad rolling stock manufacturing (289); Ship building and repairing(290); Boat building(291); Motorcycle, bicycle, and parts manufacturing(292); All other transportation equipment manufacturing(294)</p>

Note: Numbers in the parenthesis are IMPLAN sector numbers.

**I. AGGREGATION SCHEME OF COMMERCIAL SECTORS USED FOR IMPLAN
INPUT-OUTPUT ANALYSIS OF THE FOREST PRODUCTS INDUSTRY IMPACTS
ON THE MISSISSIPPI ECONOMY, 2010 (continued).**

<p>TECHNOLOGY INDUSTRIES</p>	<p>Photographic and photocopying equipment manufacturing(212); Electronic computer manufacturing(234); Computer storage device manufacturing(235); Computer terminals and other computer peripheral equipment manufacturing(236); Telephone apparatus manufacturing(237); Broadcast and wireless communications equipment manufacturing(238); Other communications equipment manufacturing(239); Audio and video equipment manufacturing(240); Electron tube manufacturing(241); Bare printed circuit board manufacturing(242); Semiconductor and related device manufacturing(243); Electronic capacitor, resistor, coil, transformer, and other inductor manufacturing(244); Electronic connector manufacturing(245); Printed circuit assembly (electronic assembly) manufacturing(246); Other electronic component manufacturing(247); Electromedical and electrotherapeutic apparatus manufacturing(248); Search, detection, and navigation instruments manufacturing(249); Automatic environmental control manufacturing(250); Industrial process variable instruments manufacturing(251); Totalizing fluid meters and counting devices manufacturing(252); Electricity and signal testing instruments manufacturing(253); Analytical laboratory instrument manufacturing(254); Irradiation apparatus manufacturing(255); Software, audio, and video media for reproduction(257); Magnetic and optical recording media manufacturing(258); Guided missile and space vehicle manufacturing(287); Military armored vehicle, tank, and tank component manufacturing(293); Surgical and medical instrument, laboratory and medical instrument manufacturing(305); Surgical appliance and supplies manufacturing(306); Dental equipment and supplies manufacturing(307); Ophthalmic goods manufacturing(308); Dental laboratories manufacturing(309)</p>
<p>TRANSPORTATION AND COMMUNICATION SERVICES</p>	<p>Transport by air(332); Transport by rail(333); Transport by water(334); Transport by truck(335); Transit and ground passenger transportation(336); Transport by pipeline(337); Scenic and sightseeing transportation and support activities for transportation(338)</p>

Note: Numbers in the parenthesis are IMPLAN sector numbers.

I. AGGREGATION SCHEME OF COMMERCIAL SECTORS USED FOR IMPLAN INPUT-OUTPUT ANALYSIS OF THE FOREST PRODUCTS INDUSTRY IMPACTS ON THE MISSISSIPPI ECONOMY, 2010 (continued).

<p>MISCELLANEOUS MANUFACTURING</p>	<p>Nonwoven fabric mills(78); Knit fabric mills(79); Fabric coating mills(81); Carpet and rug mills(82); Curtain and linen mills(83);Textile bag and canvas mills(84); All other textile product mills(85); Apparel knitting mills(86); Cut and sew apparel contractors(87); Men's and boys' cut and sew apparel manufacturing(88); Women's and girls' cut and sew apparel manufacturing(89); Other cut and sew apparel manufacturing(90); Apparel accessories and other apparel manufacturing(91); Footwear manufacturing(93); Manufactured home (mobile home) manufacturing(101); Stationery product manufacturing(110); Printing(113); Support activities for printing(114); Watch, clock, and other measuring and controlling device manufacturing(256); Metal and other household furniture (except wood) manufacturing(298); Institutional furniture manufacturing (299); Showcase, partition, shelving, and locker manufacturing(302); Mattress manufacturing(303); Blind and shade manufacturing(304); Jewelry and silverware manufacturing(310); Sporting and athletic goods manufacturing(311); Doll, toy, and game manufacturing(312); Office supplies (except paper) manufacturing(313); Sign manufacturing(314); Gasket, packing, and sealing device manufacturing(315); Musical instrument manufacturing(316); All other miscellaneous manufacturing(317); Broom, brush, and mop manufacturing(318); Couriers and messengers(339); Accounting, tax preparation, bookkeeping, and payroll services(368); Architectural, engineering, and related services(369); Specialized design services(370); Custom computer programming services(371); Computer systems design services(372); Other computer related services, including facilities management(373); Management, scientific, and technical consulting services(374); Environmental and other technical consulting services(375); Scientific research and development services(376); Advertising and related services(377); Photographic services(378); Veterinary services (379); All other miscellaneous professional, scientific, and technical services(380); Management of companies and enterprises(381);Employment services (382); Travel arrangement and reservation services(383); Office administrative services(384); Facilities support services(385);Business support services(386); Investigation and security services(387); Services to buildings and dwellings(388);Private household operations(426)</p>
<p>UTILITY SERVICES</p>	<p>Electric power generation, transmission, and distribution(31); Natural gas distribution(32); Water, sewage and other treatment and delivery systems(33); Waste management and remediation services(390)</p>
<p>WHOLESALE AND RETAIL TRADE</p>	<p>Wholesale trade businesses (319); Retail Stores - Motor vehicle and parts(320); Retail Stores - Furniture and home furnishings(321); Retail Stores - Electronics and appliances(322); Retail Stores - Building material and garden supply(323); Retail Stores - Food and beverage(324); Retail Stores - Health and personal care(325); Retail Stores - Gasoline stations(326); Retail Stores - Clothing and clothing accessories(327); Retail Stores - Sporting goods, hobby, book and music(328); Retail Stores - General merchandise(329); Retail Stores - Miscellaneous(330); Retail Nonstores - Direct and electronic sales(331); Warehousing and storage(340); Newspaper publishers(341);Periodical publishers(342); Book publishers(343); Directory, mailing list, and other publishers(344); Software publishers(345);Sound recording industries</p>
<p>FINANCIAL AND REAL ESTATE</p>	<p>Monetary authorities and depository credit intermediation activities(354); Nondepository credit intermediation and related activities(355); Securities, commodity contracts, investments, and related activities(356); Insurance carriers(357); Insurance agencies, brokerages, and related activities(358); Funds, trusts, and other financial vehicles(359); Real estate establishments(360)</p>

Note: Numbers in the parenthesis are IMPLAN sector numbers.

I. AGGREGATION SCHEME OF COMMERCIAL SECTORS USED FOR IMPLAN INPUT-OUTPUT ANALYSIS OF THE FOREST PRODUCTS INDUSTRY IMPACTS ON THE MISSISSIPPI ECONOMY, 2010 (continued).

MISCELLANEOUS SERVICES	Data processing, hosting, ISP, web search portals and related services(352); Other information services(353); Legal services(367); Other support services(389); Nursing and residential care facilities(398); Child day care services(399); Individual and family services(400); Community food, housing, and other relief services, including rehabilitation services(401); Hotels and motels, including casino hotels (411); Other accommodations(412); Food services and drinking places(413); Automotive repair and maintenance, except car washes(414); Car washes(415); Electronic and precision equipment repair and maintenance(416); Commercial and industrial machinery and equipment repair and maintenance(417); Personal and household goods repair and maintenance(418); Personal care services(419); Death care services(420); Dry-cleaning and laundry services(421); Other personal services(422); Religious organizations(423); Grantmaking, giving, and social advocacy organizations(424); Civic, social, professional, and similar organizations(425)
RECREATION AND AMUSEMENT	Motion picture and video industries(346); Performing arts companies(402); Spectator sports companies(403); Promoters of performing arts and sports and agents for public figures(404); Independent artists, writers, and performers(405); Museums, historical sites, zoos, and parks(406); Fitness and recreational sports centers(407); Bowling centers(408); Amusement parks, arcades, and gambling industries(409); Other amusement and recreation industries(410)
HEALTH SERVICES	Offices of physicians, dentists, and other health practitioners(394); Home health care services(395); Medical and diagnostic labs and outpatient and other ambulatory care services(396); Private hospitals(397)
EDUCATION	Private elementary and secondary schools(391); Private junior colleges, colleges, universities, and professional schools(392); Other private educational services(393); Employment and payroll only (state & local govt, education)(438)
GOVERNMENT	US Postal Service(427); Federal electric utilities(428); Other Federal Government enterprises(429); State and local government passenger transit(430); State and local government electric utilities(431); Other state and local government enterprises(432); Employment and payroll only (state & local govt, non-education)(437); Employment and payroll only (federal govt, non-military)(439); Employment and payroll only (federal govt, military)(440)
DOMESTIC SERVICES	Radio and television broadcasting(348); Cable and other subscription programming(349); Internet publishing and broadcasting(350); Telecommunications(351); Automotive equipment rental and leasing(362); General and consumer goods rental except video tapes and discs(363); Video tape and disc rental(364); Commercial and industrial machinery and equipment rental and leasing(365); Lessors of nonfinancial intangible assets(366)
BALANCE	Imputed rental activity for owner-occupied dwellings(361); Not an industry (Used and secondhand goods)(433); Not an industry (Scrap)(434); Not an industry (Rest of the world adjustment)(435); Not an industry (Noncomparable foreign imports)(436)

Note: Numbers in the parenthesis are IMPLAN sector numbers.

2. DIRECT EFFECTS ON MISSISSIPPI EMPLOYMENT, WAGES, OUTPUT, AND VALUE-ADDED OF THE AGGREGATED ECONOMIC SECTOR (2010).

Model Sectors	Employment	Wages and Salaries (\$MM)	Output (\$MM)	Value-added (\$MM)
Miscellaneous Forest Products	449	32.91	195.79	102.56
Logging	5,734	244.35	1,042.39	239.28
Solid Wood Products	8,443	391.06	1,710.46	541.64
Wood Furniture	17,882	654.90	2,654.62	937.44
Pulp and Paper	3,623	309.24	2,063.57	616.42
Forest Products Industry	36,130	1,632.46	7,666.83	2,437.35
Resource Services	7,972	222.46	352.70	244.73
Mining	14,241	1,029.49	2,834.48	1,855.63
Construction	87,456	3,018.59	9,591.32	3,721.96
Agricultural Products	46,875	1,149.56	4,881.19	1,312.85
Agricultural Processing	19,022	620.34	6,088.19	809.89
Food Processing	5,452	185.80	2,006.42	275.03
Farm Input and Machinery	2,166	121.40	1,877.78	269.32
Fabric Mills and Leather	821	29.54	156.52	43.77
Miscellaneous Manufacturing	157,853	5,178.57	10,525.22	6,110.24
Petroleum and Chemicals	13,203	1,092.59	21,937.64	3,137.67
Glass, Stone and Clay	3,269	163.29	741.40	256.33
Metal Industries	11,655	643.83	3,580.83	1,016.07
Machinery and Equipment	15,136	831.85	4,963.75	1,434.92
Transportation equipment	23,645	159.93	1,138.25	253.08
Technology Industries	3,245	1,659.25	10,743.46	2,279.07
Transportation and Communication Services	35,716	1,827.63	4,585.75	2,314.23
Utility Services	11,464	843.81	3,828.79	2,886.97
Wholesale and Retail Trade	209,665	6,847.86	15,325.57	10,553.23
Financial and Real Estate	110,351	3,161.13	14,728.64	7,648.72
Miscellaneous Services	243,943	6,490.83	14,894.97	8,603.18
Recreation and Amusement	24,662	424.69	1,550.87	881.18
Health Services	83,906	5,005.28	9,047.88	5,327.60
Education	126,515	5,569.44	6,707.90	6,096.33
Government	182,153	9,999.07	14,133.49	12,184.93
Domestic Services	15,551	708.39	3,722.59	2,029.19
Total Sectors	1,492,066	58,617.05	177,612.44	83,983.49

3. TOTAL IMPACTS OF THE LOGGING SECTOR ON MISSISSIPPI EMPLOYMENT, WAGES, OUTPUT, AND VALUE-ADDED FOR THE AGGREGATED ECONOMIC SECTOR (2010).

Model Sectors	Employment	Wages and Salaries (\$MM)	Output (\$MM)	Value-added (\$MM)
Miscellaneous Forest Products	261	19.21	114.29	59.87
Logging	5,734	244.35	1,042.39	239.28
Solid Wood Products	19	0.87	4.07	1.00
Wood Furniture	3	0.09	.37	0.13
Pulp and Paper	1	0.05	.28	0.08
Resource Services	811	25.52	32.67	25.03
Mining	2	0.15	.38	0.27
Construction	29	1.00	2.70	1.24
Agricultural Products	202	5.48	15.15	5.14
Agricultural Processing	8	0.26	2.43	0.35
Food Processing	4	0.16	1.95	0.26
Farm Input and Machinery	4	0.25	4.11	0.55
Fabric Mills and Leather	0	0.00	0.02	0.00
Miscellaneous Manufacturing	434	13.37	24.34	15.70
Petroleum and Chemicals	4	0.42	11.95	1.55
Glass, Stone and Clay	1	0.04	0.17	0.06
Metal Industries	1	0.03	0.17	0.05
Machinery and Equipment	1	0.03	0.22	0.06
Transportation equipment	1	0.06	0.68	0.10
Technology Industries	0	0.01	0.04	0.01
Transportation and Communication Services	217	10.84	25.38	13.51
Utility Services	25	1.77	7.91	6.05
Wholesale and Retail Trade	793	28.69	64.45	45.69
Financial and Real Estate	420	11.84	57.19	28.76
Miscellaneous Services	946	27.53	58.35	34.60
Recreation and Amusement	70	1.09	3.90	2.13
Health Services	309	18.47	33.49	19.68
Education	77	2.28	4.03	2.06
Government	41	2.43	7.95	2.28
Domestic Services	58	2.76	13.28	7.16
Total Sectors	10,474	419.05	1,534.30	512.74

4. TOTAL IMPACTS OF THE SOLID WOOD PRODUCTS SECTOR ON MISSISSIPPI EMPLOYMENT, WAGES, OUTPUT, AND VALUE-ADDED FOR THE AGGREGATED ECONOMIC SECTOR (2010).

Model Sectors	Employment	Wages and Salaries (\$MM)	Output (\$MM)	Value-added (\$MM)
Miscellaneous Forest Products	174	12.77	75.94	39.78
Logging	1,266	53.94	230.10	52.82
Solid Wood Products	8,443	391.06	1,710.46	541.64
Wood Furniture	22	0.79	3.17	0.94
Pulp and Paper	4	0.24	1.46	0.35
Resource Services	369	11.59	14.95	11.43
Mining	4	0.29	0.73	0.52
Construction	166	5.78	16.02	7.15
Agricultural Products	130	4.00	10.67	3.60
Agricultural Processing	14	0.48	4.45	0.64
Food Processing	7	0.30	3.54	0.48
Farm Input and Machinery	3	0.16	2.83	0.37
Fabric Mills and Leather	1	0.04	0.24	0.06
Miscellaneous Manufacturing	1,108	35.56	69.71	43.05
Petroleum and Chemicals	11	1.07	25.02	3.31
Glass, Stone and Clay	3	0.18	0.80	0.30
Metal Industries	4	0.24	1.32	0.35
Machinery and Equipment	2	0.09	0.57	0.17
Transportation equipment	2	0.11	1.18	0.18
Technology Industries	0	0.02	0.10	0.03
Transportation and Communication Services	559	28.89	67.52	36.36
Utility Services	124	10.50	49.31	38.40
Wholesale and Retail Trade	1,441	52.56	118.12	83.40
Financial and Real Estate	806	23.27	106.53	54.06
Miscellaneous Services	1,634	44.34	97.17	56.66
Recreation and Amusement	138	2.02	0.10	0.03
Health Services	540	32.30	58.58	34.40
Education	124	3.71	6.56	3.38
Government	95	5.65	19.42	5.49
Domestic Services	128	5.83	29.89	16.02
Total Sectors	17,321	727.79	2,733.64	1,039.22

5. TOTAL IMPACTS OF THE WOOD FURNITURE SECTOR ON MISSISSIPPI EMPLOYMENT, WAGES, OUTPUT, AND VALUE-ADDED FOR THE AGGREGATED ECONOMIC SECTOR (2010).

Model Sectors	Employment	Wages and Salaries (\$MM)	Output (\$MM)	Value-added (\$MM)
Miscellaneous Forest Products	16	1.16	6.93	3.63
Logging	111	4.73	20.17	4.63
Solid Wood Products	516	24.45	110.06	30.68
Wood Furniture	17,882	6,54.90	2,654.62	937.44
Pulp and Paper	30	1.83	11.01	2.51
Resource Services	38	1.18	1.73	1.29
Mining	3	0.24	0.60	0.42
Construction	139	4.82	13.27	5.98
Agricultural Products	48	1.53	4.42	1.41
Agricultural Processing	20	0.69	6.37	0.93
Food Processing	10	0.43	5.15	0.70
Farm Input and Machinery	1	0.06	1.33	0.16
Fabric Mills and Leather	82	4.28	20.32	6.99
Miscellaneous Manufacturing	1,538	50.67	109.10	65.05
Petroleum and Chemicals	206	9.62	75.98	16.53
Glass, Stone and Clay	7	0.39	1.84	0.70
Metal Industries	35	2.01	11.64	3.20
Machinery and Equipment	5	0.24	1.43	0.43
Transportation equipment	3	0.21	1.88	0.31
Technology Industries	1	0.05	0.40	0.07
Transportation and Communication Services	624	30.89	71.63	38.23
Utility Services	110	8.47	38.26	29.73
Wholesale and Retail Trade	2,526	93.76	210.70	148.66
Financial and Real Estate	1,275	34.49	168.87	82.96
Miscellaneous Services	2,163	56.40	125.55	72.58
Recreation and Amusement	199	2.85	10.46	5.50
Health Services	787	47.04	85.33	50.11
Education	177	5.30	9.35	4.82
Government	122	7.17	24.14	6.84
Domestic Services	193	8.66	44.48	23.31
Total Sectors	28,867	1,058.56	3,847.01	1,545.79

6. TOTAL IMPACTS OF THE PULP AND PAPER SECTOR ON MISSISSIPPI EMPLOYMENT, WAGES, OUTPUT, AND VALUE-ADDED FOR THE AGGREGATED ECONOMIC SECTOR (2010).

Model Sectors	Employment	Wages and Salaries (\$MM)	Output (\$MM)	Value-added (\$MM)
Miscellaneous Forest Products	16	1.16	6.92	3.62
Logging	273	11.64	49.68	11.40
Solid Wood Products	210	9.14	39.55	10.86
Wood Furniture	8	0.27	1.09	0.34
Pulp and Paper	3,623	309.24	2,063.57	616.42
Resource Services	47	1.46	1.99	1.50
Mining	23	1.42	3.36	1.97
Construction	213	7.42	20.64	9.17
Agricultural Products	34	0.98	2.79	0.95
Agricultural Processing	12	0.41	4.94	0.58
Food Processing	6	0.25	2.90	0.39
Farm Input and Machinery	1	0.11	1.79	0.22
Fabric Mills and Leather	1	0.02	0.13	0.03
Miscellaneous Manufacturing	1,263	43.94	88.35	52.66
Petroleum and Chemicals	31	2.77	42.33	6.34
Glass, Stone and Clay	3	0.15	0.69	0.24
Metal Industries	7	0.41	1.88	0.62
Machinery and Equipment	3	0.16	0.83	0.25
Transportation equipment	2	0.13	1.11	0.18
Technology Industries	1	0.03	0.17	0.04
Transportation and Communication Services	497	27.61	67.26	36.16
Utility Services	202	16.79	84.55	60.67
Wholesale and Retail Trade	1,397	55.13	124.39	89.25
Financial and Real Estate	685	19.91	90.04	45.85
Miscellaneous Services	1,426	39.32	85.92	50.42
Recreation and Amusement	120	1.69	6.17	3.23
Health Services	441	26.36	47.80	28.07
Education	102	3.03	5.35	2.76
Government	112	6.47	24.30	6.26
Domestic Services	120	5.41	28.73	15.53
Total Sectors	10,875	592.82	2,899.20	1,056.00

7. TOTAL IMPACTS OF THE FOREST PRODUCTS INDUSTRY ON MISSISSIPPI EMPLOYMENT, WAGES, OUTPUT, AND VALUE-ADDED FOR THE AGGREGATED ECONOMIC SECTOR (2010).

Model Sectors	Employment	Wages and Salaries (\$MM)	Output (\$MM)	Value-added (\$MM)
Miscellaneous Forest Products	449	32.91	195.79	102.56
Logging	5,734	244.35	1,042.39	239.28
Solid Wood Products	8,443	391.06	1,710.46	541.64
Wood Furniture	17,882	654.90	2,654.62	937.44
Pulp and Paper	3,623	309.24	2,063.57	616.42
Resource Services	1,118	35.15	45.43	34.74
Mining	32	2.04	4.91	3.06
Construction	525	18.27	50.57	22.60
Agricultural Products	364	10.36	28.81	9.69
Agricultural Processing	51	1.74	17.19	2.36
Food Processing	26	1.08	12.73	1.73
Farm Input and Machinery	8	0.54	9.22	1.19
Fabric Mills and Leather	84	4.34	20.67	7.08
Miscellaneous Manufacturing	4,134	136.93	279.03	168.59
Petroleum and Chemicals	250	13.70	150.30	27.07
Glass, Stone and Clay	14	0.74	3.36	1.26
Metal Industries	46	2.66	14.88	4.19
Machinery and Equipment	9	0.50	2.94	0.88
Transportation equipment	8	0.49	4.59	0.73
Technology Industries	2	0.09	0.69	0.14
Transportation and Communication Services	1,785	92.50	218.35	117.07
Utility Services	443	36.15	173.66	129.89
Wholesale and Retail Trade	5,822	217.88	490.10	347.52
Financial and Real Estate	3,009	84.48	399.00	199.66
Miscellaneous Services	5,782	156.63	343.47	200.41
Recreation and Amusement	499	7.21	26.22	13.87
Health Services	1,950	116.66	211.56	124.25
Education	450	13.43	23.71	12.20
Government	352	20.60	72.12	19.80
Domestic Services	472	21.40	110.15	58.65
Total Sectors	63,365	2,628.04	10,380.48	3,945.98

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