

FORESTRY IN MISSISSIPPI

*The Contribution of the Industry to the Mississippi
Economy: An Input-Output Analysis*

BASED ON 2014 DATA



MISSISSIPPI STATE UNIVERSITY™
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RESEARCH BULLETIN

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Economy: An Input-Output Analysis*

— *by* —

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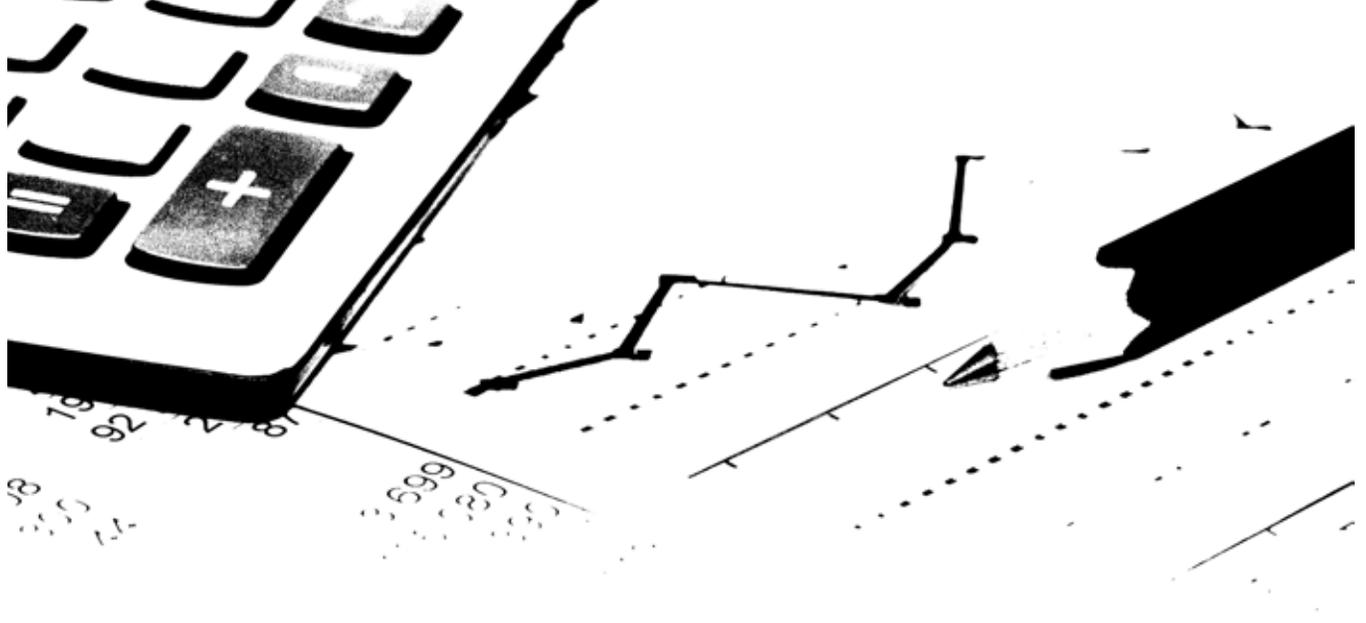


INTRODUCTION

Mississippi's forest resources, covering 19.5 million acres - 65% of total land area (Oswalt, 2013), make substantial economic contributions to the state's economy. For example, in 2010 the forest products industry contributed \$10.38 billion to the state's economy and generated 4.25% of total jobs (Dahal et al. 2013). In 2014, \$1.02 billion worth of forest timber was harvested and delivered to mills and other manufacturing industries (Henderson 2015). Given the importance of the industry to the state's economy, a number of studies have evaluated and reported its contributions (e.g., Munn and Henderson 2002, Henderson et al. 2008, Dahal et al. 2013).

Using the most recent data available (2014), this study updates the economic contribution of the forest products industry as a whole and individually for its four main components: logging, solid wood products, pulp and paper, and wood

furniture manufacturing sectors. Economic contributions of the industry were measured by four key statistics: (1) employment - the number of full- and part-time jobs; (2) labor income - consisting of employee compensation and proprietary income; (3) output - the total value of production for a given sector; and (4) value-added - new wealth created by the industry's economic activity and is disbursed through employee compensation, proprietary income, property income, and indirect business taxes. In addition, economic contributions were estimated in terms of direct, indirect, and induced effects. Direct effects are due to the industry's own activity that flows throughout the economy. Indirect effects result from inter-industry spending in response to original industry demand by supporting sectors of the economy. Induced effects are a result of spending made by employees of both direct and indirect sectors. Total effects are the sum of direct, indirect, and induced effects



METHODS & DATA

The Impact Analysis for Planning (IMPLAN) software and data were used to construct an input-output model of the Mississippi economy to estimate the economic contribution of the forest products industry to Mississippi. 2014 IMPLAN data, the most recent available, was used and results are reported in 2014 dollars. IMPLAN was originally developed by the USDA Forest Service and is currently maintained by the IMPLAN Group LLC (2015). It is a flexible model where the user can aggregate different industrial sectors (Rickman and Schwer 2001), alter production functions, modify the database (MIG Inc. 2004) if better data are available and deflate or inflate results so the outputs can be expressed in current dollar values of the desired output date.

IMPLAN summarizes the economy into 536 sectors. For reporting purpose these sectors were aggregated into 31 sectors following Barnett

and Reinschmiedt (1995). This aggregation scheme is also consistent with previous economic contribution analyses (e.g., Munn and Henderson 2002, Henderson et al. 2008, Henderson and Munn 2013, Dahal et al. 2013). The 31 sector aggregation scheme consists of one miscellaneous forest products sector, four major forest products sectors, and 26 non-forestry related sectors (Table A.1) This study estimated the economic contribution of each of the major forest products sectors (logging, solid wood products, wood furniture, and pulp and paper industry) and the forest products industry as a whole. Direct effects of each sector were estimated using 2014 IMPLAN data, except for the logging sector, which was derived from 2014 Harvest of Forest Products Report (Henderson 2015). In addition, total tax contributions were calculated for the forest products industry.



RESULTS

The Mississippi economy, including the forest products industry, is presented in Table 1. The economic contribution of each of the major forest products sectors to the state economy is presented in Tables 2, 3, 4, and 5. The economic contribution of the forest products industry as a whole is presented in Table 6. Employment, labor income, output, and value-added for each aggregated industry are also reported. The tax contributions of the forest products industry in terms of state and local tax and federal tax are presented in Tables 7 and 8, respectively.

Table 1 reports the direct effects, whereas Tables 2 to 6 include the direct effect of the sector of interest and the resultant indirect and induced effects occurring in all other sectors of the state economy. Total effects are reported in the table row titled Totals. Table 6 reports the total effects of the aggregated forest-related sectors. Summing the effects of the individual forest-

related sectors overestimates the contribution of the forest products industry. Aggregating forest-related sectors will internalize the indirect and induced effects on other forest-related sectors and thus provide a more precise contribution of the industry on the state economy.

The forest products industry produced 3.84% of the total industry output economy in Mississippi in 2014 (Table 1). The industry employed 40,158 workers, equivalent to 2.62% of the state's total jobs, and paid \$2.0 billion in labor income. The industry's average annual income was \$47,764 compared to \$42,661 for the state as a whole; approximately \$5,000 more than the state average. Value-added generated by the industry was \$8.92 billion.



LOGGING

Logging is a first step in the timber supply chain, providing raw materials to other forest products sectors. According to the North American Industrial Classification System (NAICS) definition, the logging industry is engaged in one or more of the following: (1) cutting timber, (2) cutting and transporting timber, and (3) producing wood chips in the field.

The logging sector employed 10,634 workers and paid \$500.39 million in labor income (Table 1). Average annual labor income for this sector was \$47,056 compared to \$42,661 for the state. Total industry output of this sector was \$1.03 billion and value-added was \$576.47 million. The logging sector's total contribution (direct, indirect, and induced) amounted to 16,127 jobs with \$706.65 million in labor income and \$877.75 million in value-added (Table 2). Total output contribution was \$1.60 billion including \$573 million of additional economic activity occurring

in other sectors of the economy resulting from indirect and induced effects.

In terms of employment, the sectors most benefited from the logging sector included miscellaneous services, wholesale and retail trade, and resource services. The logging sector contributed more than 800 jobs to each of these sectors.

Additionally, the logging sector generated \$79.42 million of state and local government non-education taxes (Table 7) and \$119.34 million of federal non-defense taxes (Table 8).



SOLID WOOD PRODUCTS

The solid wood products sector includes sawmills, wood preservation, veneer and plywood manufacturing, engineered wood member and truss manufacturing, reconstituted wood product manufacturing, cut stock, resawing lumber, and planning, other millwork, including flooring, wood container and pallet manufacturing, prefabricated wood building manufacturing, all other miscellaneous wood product manufacturing, and custom architectural woodwork and millwork (Table A.1)

The solid wood products sector created 9,071 jobs and paid \$447.63 million in labor income

(Table 1). Average annual income for this sector was \$49,347; \$6,686 higher than the state average. Total contribution of this sector amounted to 22,090 jobs with labor income of \$991.92 million (Table 3). Total output and value-added contribution was \$4.16 billion and \$1.51 billion, respectively. The solid wood products sector generated \$123.76 million in state and local government non-education taxes (Table 7) and \$212.33 million in federal non-defense taxes (Table 8).



WOOD FURNITURE

The wood furniture sector includes wood windows and door manufacturing, wood kitchen cabinet and countertop manufacturing, upholstered household furniture manufacturing, non-upholstered wood household furniture manufacturing, and wood office furniture manufacturing (Table A.1).

The wood furniture sector was the largest forest products industry sector. This sector employed 16,178 workers and paid \$625.55 million in wages and salaries (Table 1). The average annual income for employees was \$38,668; about \$4,000 lower

than the state average. Total contribution made by this sector amounted to 26,193 jobs with \$1.03 billion in income (Table 4). Total output contribution was \$4.29 billion and value-added was \$1.38 billion.

The wood furniture sector generated \$115.57 million in state and local government non-education taxes (Table 7) and \$212.19 million in federal non-defense taxes (Table 8).



PULP AND PAPER

The pulp and paper sector includes pulp mills, paper mills, paperboard mills, paperboard container manufacturing, paper bag and coated and treated paper manufacturing, stationary product manufacturing, sanitary paper product manufacturing, and all other converted paper product manufacturing (Table A.1).

This sector directly employed 3,770 and paid \$313.21 million in wages and salaries (Table 1). Average annual income for this sector was \$83,072; \$40,411 higher than the state average.

The total contribution made by the sector amounted to 11,274 jobs, \$627.68 million in income and \$3.47 billion of output, of which \$1.10 billion was value added (Table 5).

The pulp and paper sector generated \$88.21 million in state and local government non-education taxes (Table 7) and \$147.62 million of federal non-defense taxes (Table 10).



TOTAL CONTRIBUTION

The forest products industry's employment contribution (direct, indirect, and induced) accounted for 4.42% of all jobs in Mississippi. The average annual income in forestry-related occupations was \$47,764 (Table 1)

The forest products industry's total contribution for output was \$12.79 billion and related value-added was \$4.52 billion. Similarly, the employment contribution was 69,445 with an annual payroll of \$3.08 billion (Table 6). The industrial sectors that benefited most from the

forest products industry in terms of employment were miscellaneous services, wholesale and retail trade, and miscellaneous manufacturing. Total jobs in these sectors were 18,273 accounting for 62.39% of additional jobs tied to the forest products industry.

Mississippi's forest product industry generated \$375.32 million in state and local government non-education tax (Table 7) and \$643.12 million of federal non-defense tax (Table 8), total of \$1.02 billion in tax revenue in 2014.



DISCUSSION AND CONCLUSION

The Mississippi's forest products industry is important to the state economy. However, the performance of the industry is very sensitive to the performance of the economy as a whole. For instance, the 2007-2009 U.S. recession and housing market collapse resulted in a decrease in the economic contribution of the forest products industry in Mississippi which declined from a \$17.38 billion industry in 2006 (Henderson et al. 2008) to \$10.38 billion in 2010 (Dahal et. al 2013).

With the end of recession in 2009 and a gradual improvement of the U.S. economy and housing market, the economic contribution of the industry is also improving. Between 2010 and 2014, forest

products industry employment, labor income, output, and value-added increased by 11.15%, 17.50%, 16.40%, and 9.22%, respectively. Average annual income increased from \$45,183 to \$47,764. Total effects mirrored the direct effects with total employment, labor income, output, and value-added increasing by 9.60%, 17.36%, 23.25%, and 14.62%, respectively.

Thus, the forest products industry remains a major economic contributor to the state economy. With continued improvement in the overall U.S. economy, the forest products industry is expected to make increased economic contributions to the Mississippi economy in the future.

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Table 1. Direct Effects on Mississippi Employment, Labor-Income, Output, and Value-Added of the Aggregated Economic Sectors (2014).

Model Sector	Employment	Labor Income \$MM	Output \$MM	Value-added \$MM
Miscellaneous Forest Products	505	31.29	58.76	34.32
Logging	10,634	500.39	1,026.96	576.47
Solid Wood Products	9,071	447.63	2,581.69	720.05
Wood Furniture	16,178	625.55	2,847.39	728.71
Pulp and Paper	3,770	313.21	2,409.27	602.40
Forest Products Industry	40,158	1,918.08	8,924.07	2,661.96
Resource Services	6,192	196.11	315.41	233.26
Mining	16,823	1,350.37	4,654.82	2,003.80
Construction	90,741	4,056.86	15,218.63	5,614.81
Agricultural Products	37,850	2,141.98	6,339.22	3,288.21
Agricultural Processing	18,293	688.37	7,326.19	1,186.53
Food Processing	7,183	256.04	2,188.61	552.50
Farm Input and Machinery	2,239	136.04	2,640.12	467.27
Fabric Mills and Leather	785	28.31	196.22	71.58
Miscellaneous Manufacturing	179,504	6,461.24	15,595.11	8,060.29
Petroleum and Chemicals	14,158	1,212.71	27,017.48	3,325.10
Glass, Stone, and Clay	3,481	173.66	992.30	304.19
Metal Industries	13,835	830.64	5,709.40	1,522.77
Machinery and Equipment	18,197	1,110.37	7,294.55	1,868.53
Transportation Equipment	26,868	2,068.04	14,622.33	2,580.56
Technology industries	2,899	170.42	1,036.31	266.73
Transportation and Communication Services	38,268	2,093.68	6,930.45	2,912.26
Utility Services	11,534	964.80	8,864.85	3,017.66
Wholesale and Retail Trade	214,933	7,587.13	21,974.69	13,522.60
Financial and Real Estate	97,006	3,366.15	16,824.37	8,686.89
Miscellaneous Services	275,896	6,792.87	16,838.27	9,652.91
Recreation and Amusement	24,998	441.68	2,103.48	1,066.16
Health Services	90,013	5,667.86	10,288.41	6,240.21
Education	111,829	4,798.18	5,985.04	5,563.58
Government	169,973	9,824.18	14,230.21	12,201.41
Domestic Services	16,528	942.86	7,997.55	2,634.72
Total	1,530,182	65,278.63	232,108.08	99,506.49

Table 2. Total Effects of the Logging Sector on Mississippi Employment, Labor-Income, Output, and Value-Added of the Aggregated Economic Sectors (2014).

Model Sector	Employment	Labor Income \$MM	Output \$MM	Value-added \$MM
Miscellaneous Forest Products	304	18.87	35.43	20.69
Logging	10,634	500.39	1,026.96	576.47
Solid Wood Products	49	2.47	14.89	3.86
Wood Furniture	2	0.07	0.30	0.08
Pulp and Paper	1	0.04	0.32	0.08
Resource Services	800	28.43	41.31	31.84
Mining	9	0.74	2.47	1.02
Construction	50	2.25	8.04	3.03
Agricultural Products	355	8.75	20.84	12.47
Agricultural Processing	9	0.31	3.20	0.53
Food Processing	5	0.18	1.71	0.38
Farm Input and Machinery	3	0.14	3.42	0.53
Fabric Mills and Leather	0.00	0.00	0.00	0.00
Miscellaneous Manufacturing	475	14.47	29.71	17.02
Petroleum and Chemicals	5	0.59	22.00	1.54
Glass, Stone, and Clay	2	0.08	0.44	0.13
Metal Industries	1	0.05	0.23	0.07
Machinery and Equipment	1	0.04	0.30	0.07
Transportation Equipment	2	0.15	2.12	0.23
Technology industries	0	0.00	0.04	0.01
Transportation and Communication Services	205	10.64	32.21	13.47
Utility Services	25	2.00	17.84	6.07
Wholesale and Retail Trade	843	32.80	97.92	60.13
Financial and Real Estate	371	13.16	65.80	34.42
Miscellaneous Services	1,249	31.42	72.90	43.27
Recreation and Amusement	93	1.53	7.08	3.48
Health Services	431	27.19	49.97	30.15
Education	88	2.66	5.53	3.41
Government	50	3.18	8.55	2.36
Domestic Services	66	4.01	28.80	10.94
Total	16,127	706.65	1,600.35	877.75

Table 3. Total Effects of the Solid Wood Sector on Mississippi Employment, Labor-Income, Output, and Value-Added of the Aggregated Economic Sectors (2014).

Model Sector	Employment	Labor Income \$MM	Output \$MM	Value-added \$MM
Miscellaneous Forest Products	94	5.81	10.91	6.37
Logging	3,272	153.96	315.98	177.37
Solid Wood Products	9,071	447.63	2,581.69	720.05
Wood Furniture	3	0.12	0.56	0.15
Pulp and Paper	6	0.41	2.85	0.62
Resource Services	248	8.81	12.81	9.87
Mining	24	1.90	6.41	2.67
Construction	231	10.47	36.68	14.15
Agricultural Products	135	3.95	9.36	5.52
Agricultural Processing	13	0.47	4.79	0.78
Food Processing	7	0.27	2.60	0.57
Farm Input and Machinery	1	0.07	1.77	0.27
Fabric Mills and Leather	0	0.01	0.07	0.02
Miscellaneous Manufacturing	1,968	71.25	149.53	84.06
Petroleum and Chemicals	14	1.57	48.76	3.91
Glass, Stone, and Clay	7	0.37	2.17	0.73
Metal Industries	12	0.59	2.53	0.76
Machinery and Equipment	4	0.23	1.63	0.40
Transportation Equipment	5	0.33	3.87	0.47
Technology industries	0	0.02	0.17	0.03
Transportation and Communi- cation Services	660	36.84	113.44	51.09
Utility Services	148	13.12	123.94	41.89
Wholesale and Retail Trade	1,880	82.98	259.07	156.20
Financial and Real Estate	793	29.86	135.69	69.73
Miscellaneous Services	2,264	58.06	145.45	82.15
Recreation and Amusement	210	2.82	12.81	5.91
Health Services	613	38.64	70.99	42.83
Education	120	3.62	7.50	4.63
Government	139	9.15	27.14	7.61
Domestic Services	149	8.56	65.07	22.72
Total	22,090	991.92	4,156.25	1,513.56

Table 4. Total Effects of the Wood Furniture Sector on Mississippi Employment, Labor-Income, Output, and Value-Added of the Aggregated Economic Sectors (2014).

Model Sector	Employment	Labor Income \$MM	Output \$MM	Value-added \$MM
Miscellaneous Forest Products	3	0.16	0.30	0.18
Logging	88	4.15	8.51	4.78
Solid Wood Products	203	10.39	63.68	16.80
Wood Furniture	16,178	625.55	2,847.39	728.71
Pulp and Paper	36	2.45	16.51	3.51
Resource Services	9	0.31	0.48	0.36
Mining	11	0.85	2.93	1.24
Construction	141	6.40	22.54	8.63
Agricultural Products	37	1.70	3.94	2.27
Agricultural Processing	13	0.47	4.77	0.79
Food Processing	7	0.27	2.61	0.58
Farm Input and Machinery	1	0.04	0.92	0.13
Fabric Mills and Leather	3	0.11	0.81	0.31
Miscellaneous Manufacturing	1,935	71.55	165.30	86.19
Petroleum and Chemicals	228	10.31	104.33	26.79
Glass, Stone, and Clay	7	0.42	2.34	0.93
Metal Industries	21	1.20	7.62	2.10
Machinery and Equipment	4	0.21	1.34	0.36
Transportation Equipment	7	0.46	4.99	0.63
Technology industries	1	0.03	0.32	0.05
Transportation and Communication Services	593	31.12	94.01	39.74
Utility Services	82	6.76	60.51	20.65
Wholesale and Retail Trade	2,265	98.39	308.84	185.46
Financial and Real Estate	866	32.56	146.55	67.06
Miscellaneous Services	2,044	50.90	125.35	70.82
Recreation and Amusement	202	2.90	13.74	6.51
Health Services	639	40.29	74.02	44.66
Education	124	3.73	7.72	4.76
Government	123	8.10	20.82	6.08
Domestic Services	325	19.27	176.93	50.44
Total	26,193	1,031.04	4,290.12	1,381.50

Table 5. Total Effects of the Pulp and Paper Sector on Mississippi Employment, Labor-Income, Output, and Value-Added of the Aggregated Economic Sectors (2014).

Model Sector	Employment	Labor Income \$MM	Output \$MM	Value-added \$MM
Miscellaneous Forest Products	13	0.78	1.46	0.85
Logging	437	20.57	42.21	23.69
Solid Wood Products	163	7.61	41.67	11.55
Wood Furniture	2	0.06	0.28	0.07
Pulp and Paper	3,770	313.21	2,409.27	602.40
Resource Services	34	1.22	1.78	1.37
Mining	40	2.96	12.32	6.40
Construction	221	10.01	34.97	13.54
Agricultural Products	36	1.37	3.20	1.86
Agricultural Processing	8	0.30	3.34	0.52
Food Processing	5	0.17	1.65	0.37
Farm Input and Machinery	1	0.05	0.97	0.16
Fabric Mills and Leather	1	0.05	0.36	0.14
Miscellaneous Manufacturing	1,681	61.68	130.68	73.05
Petroleum and Chemicals	20	1.96	43.85	5.01
Glass, Stone, and Clay	5	0.26	1.83	0.48
Metal Industries	12	0.64	2.53	0.85
Machinery and Equipment	7	0.40	1.80	0.55
Transportation Equipment	5	0.32	3.15	0.43
Technology industries	1	0.02	0.28	0.04
Transportation and Communi- cation Services	477	29.52	94.50	45.63
Utility Services	182	15.50	138.92	45.97
Wholesale and Retail Trade	1,310	57.38	179.52	108.38
Financial and Real Estate	520	19.57	88.94	45.80
Miscellaneous Services	1,496	39.38	97.52	55.56
Recreation and Amusement	131	1.80	8.19	3.80
Health Services	390	24.59	45.18	27.26
Education	76	2.29	4.75	2.93
Government	124	8.03	27.01	7.32
Domestic Services	107	5.97	48.95	17.40
Total	11,274	627.68	3,471.10	1,103.39

Table 6. Total Effects of the Forest Products Industry on Mississippi Employment, Labor-Income, Output, and Value-Added of the Aggregated Economic Sectors (2014).

Model Sector	Employment	Labor Income \$MM	Output \$MM	Value-added \$MM
Miscellaneous Forest Products	505	31.29	58.76	34.32
Logging	10,634	500.39	1,026.96	576.47
Solid Wood Products	9,071	447.63	2,581.68	720.05
Wood Furniture	16,178	625.55	2,847.39	728.71
Pulp and Paper	3,770	313.21	2,409.27	602.40
Resource Services	890	31.62	45.99	35.44
Mining	80	6.12	23.02	10.87
Construction	616	27.89	97.85	37.69
Agricultural Products	444	13.10	31.11	18.34
Agricultural Processing	39	1.44	14.85	2.41
Food Processing	22	0.82	7.90	1.74
Farm Input and Machinery	5	0.27	6.28	0.98
Fabric Mills and Leather	4	0.16	1.24	0.47
Miscellaneous Manufacturing	5,805	210.60	457.93	250.48
Petroleum and Chemicals	264	14.16	209.47	36.57
Glass, Stone, and Clay	20	1.10	6.55	2.20
Metal Industries	44	2.43	12.73	3.72
Machinery and Equipment	15	0.86	4.90	1.34
Transportation Equipment	18	1.20	13.26	1.66
Technology industries	2	0.07	0.79	0.13
Transportation and Communication Services	1,831	102.58	317.29	142.67
Utility Services	422	36.15	329.87	110.73
Wholesale and Retail Trade	5,928	256.51	799.67	482.28
Financial and Real Estate	2,392	89.47	409.22	202.54
Miscellaneous Services	6,541	166.77	410.51	233.78
Recreation and Amusement	596	8.43	38.93	18.30
Health Services	1,905	120.18	220.82	133.23
Education	375	11.28	23.38	14.42
Government	412	26.98	79.47	22.23
Domestic Services	618	36.06	307.03	96.74
Total	69,445	3,084.33	12,794.11	4,522.92

Table 7. State and Local Government, Non-Education Taxes (\$MM)
Generated by the Industry in Mississippi (2014).

Description	Forest Products Industry	Miscellaneous Forest Products	Logging	Solid Wood Products	Wood Furniture	Pulp and Paper
Corporate Profit Tax	18.52	0.12	2.02	6.77	4.45	6.26
Dividends	0.84	0.01	0.09	0.31	0.20	0.28
Tax on production and imports ¹	281.39	3.45	60.74	92.67	85.75	66.41
Personal Tax ²	62.52	1.02	14.74	20.08	20.71	12.66
Security Tax ³	12.05	0.13	1.82	3.93	4.46	2.61
Total	375.32	4.71	79.42	123.76	115.57	88.21

¹Includes sales tax, property tax, motor vehicle license, severance tax, other taxes, and S/L non-taxes.

²Includes income tax, non-taxes (fines-fees), motor vehicle license, property taxes, other taxes (fish/hunt).

³Includes employee contribution, employer contribution.

Table 8. Federal, Non-Defense Taxes (\$MM) Generated by the Industry in Mississippi (2014).

Description	Forest Products Industry	Miscellaneous Forest Products	Logging	Solid Wood	Wood Furniture	Pulp and Paper
Corporate Profit Tax	96.13	0.60	10.50	35.14	23.08	32.47
Tax on production and imports ¹	36.75	0.45	7.93	12.10	11.20	8.67
Personal Tax	154.54	2.51	36.43	49.64	51.19	31.28
Security Tax ²	355.70	4.54	64.48	115.45	126.72	75.19
Total	643.12	8.10	119.34	212.33	212.19	147.62

¹Includes excise taxes, custom duty, and non-taxes.

²Includes employee contribution, employer contribution.

Table A.1. Aggregation scheme of commercial sectors used for IMPLAN input-output analysis of the forest products industry contribution to the Mississippi economy, 2014.

MODEL SECTORS	ORIGINAL IMPLAN SECTORS
MISCELLANEOUS FOREST PRODUCTS	Forestry, forest products, and timber tract production(15)
LOGGING	Commercial logging(16)
SOLID WOOD PRODUCTS	Sawmills(134); Wood preservation(135); Veneer and plywood manufacturing(136); Engineered wood member and truss manufacturing(137); Reconstituted wood product manufacturing(138); Cut Stock, resawing lumber, and planning(140); Other millwork, including flooring(141); Wood container and pallet manufacturing(142); Prefabricated wood building manufacturing(144); All other miscellaneous wood product manufacturing(145); Custom architectural woodwork and millwork(374)
WOOD FURNITURE	Wood windows and door manufacturing(139); Wood kitchen cabinet and countertop manufacturing(368); Upholstered household furniture manufacturing(369); Nonupholstered wood household furniture manufacturing(370); Wood office furniture manufacturing(373)
PULP AND PAPER	Pulp mills(146); Paper mills(147); Paperboard mills(148); Paperboard container manufacturing(149); Paper bag and coated and treated paper manufacturing(150); Stationary product manufacturing(151); Sanitary paper product manufacturing(152); All other converted paper product manufacturing(153)
RESOURCE SERVICES	Commercial fishing(17); Commercial hunting and trapping(18); Support activities for agriculture and forestry(19)
MINING	Extraction of natural gas and crude petroleum(20); Extraction of natural gas liquids(21); Coal mining(22); Iron ore mining(23); Gold ore mining(24); Silver ore mining(25); Lead and zinc ore mining(26); Copper ore mining(27); Uranium-radium-vanadium ore mining(28); Other metal ore mining(29); Stone mining and quarrying (30); Sand and gravel mining(31); Other clay, ceramic, refractory minerals mining(32); Potash, soda, and borate mineral mining(33); Phosphate rock mining(34); Other chemical and fertilizer mineral mining(35); Other nonmetallic minerals(36); Drilling oil and gas wells(37); Support activities for oil and gas operations(38); Metal mining services(39); Other nonmetallic minerals services(40)
CONSTRUCTION	Construction of new health care structures(52); Construction of new manufacturing structure(53); Construction of new power and communication structure(54); Construction of new educational and vocational structure(55); Construction of new highway and streets(56); Construction of new commercial structures, including farm structure(57); Construction of other new nonresidential structures(58); Construction of new single-family residential structures(59); Construction of new multifamily residential structures(60); Construction of other new residential structures(61); Maintenance and repair construction of nonresidential structures(62); Maintenance and repair construction of residential structures(63); Maintenance and repair construction of highways, streets, bridges, and tunnels(64)

Table A.1. Aggregation scheme of commercial sectors used for IMPLAN input-output analysis of the forest products industry contribution to the Mississippi economy, 2014 (continued).

MODEL SECTORS	ORIGINAL IMPLAN SECTORS
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); Beef cattle ranching and farming, including feedlots and dual-purpose 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(65); Flour milling(67); Rice milling(68); Malt manufacturing(69); Wet corn milling(70); Soybean and other oilseed processing(71); Fats and oils refining and blending(72); Breakfast cereal manufacturing(73); Fluid milk manufacturing(84); Creamery butter manufacturing(85); Cheese manufacturing(86); Dry, condensed, and evaporated dairy product manufacturing(87); Ice cream and frozen dessert manufacturing(88); Animal, except poultry, slaughtering(89); Meat processed and carcasses(90); Rendering and meat by-product processing(91); Poultry processing(92)
FOOD PROCESSING	Beet sugar manufacturing(74); Sugar cane mills and refining(75); Nonchocolate confectionery manufacturing(76); Chocolate and confectionery manufacturing from cacao beans(77); Confectionery manufacturing from purchased chocolate(78); Frozen fruits, juices and vegetables manufacturing(79); Frozen specialties manufacturing(80); Canned fruits and vegetables manufacturing(81); Canned specialties(82); Dehydrated food products manufacturing(83); Seafood product preparation and packaging (93); Bread and bakery product, except frozen, manufacturing(94); Frozen cakes and other pastries manufacturing(95); Cookie and cracker manufacturing(96); Dry pasta, mixes, and dough manufacturing(97); Tortilla manufacturing(98); Roasted nuts and peanut butter manufacturing(99); Other snack food manufacturing(100); Coffee and tea manufacturing(101); Flavoring syrup and concentrate manufacturing(102); Mayonnaise, dressing, and sauce manufacturing(103); Spice and extract manufacturing(104); All other food manufacturing(105); Bottled and canned soft drinks & water(106); manufactured ice(107); Breweries(108); Wineries(109); Distilleries(110); Tobacco product manufacturing(111)
FARM INPUTS AND MACHINERY	Other animal food manufacturing(66); Nitrogen fertilizer manufacturing (169); Phosphatic fertilizer manufacturing(170); Fertilizer mixing(171); Pesticide and other agricultural chemical manufacturing(172); Farm machinery and equipment manufacturing(262); Lawn and garden equipment manufacturing(263)
FABRIC MILLS AND LEATHER	Fiber, yarn, and thread mills(112); Broadwoven fabric mills(113); Narrow fabric mills and schiffli machine embroidery(114);Textile and fabric finishing mills(117); Leather and hide tanning and finishing (131); Other leather and allied product manufacturing (133)

Table A.1. Aggregation scheme of commercial sectors used for IMPLAN input-output analysis of the forest products industry contribution to the Mississippi economy, 2014 (continued).

MODEL SECTORS	ORIGINAL IMPLAN SECTORS
PETROLEUM AND CHEMICALS	Petroleum refineries(156); Asphalt paving mixture and block manufacturing (157); Asphalt shingle and coating materials manufacturing(158);Petroleum lubricating oil and grease manufacturing(159); All other petroleum and coal products manufacturing(160); Petrochemical manufacturing(161); Industrial gas manufacturing(162); Synthetic dye and pigment manufacturing(163); Other basic inorganic chemical manufacturing(164); Other basic organic chemical manufacturing(165); Plastics material and resin manufacturing(166); Synthetic rubber manufacturing(167); Artificial and synthetic fibers and filaments manufacturing(168); Medicinal and botanical manufacturing(173); Pharmaceutical preparation manufacturing(174); In-vitro diagnostic substance manufacturing(175); Biological product (except diagnostic) manufacturing(176); Paint and coating manufacturing (177); Adhesive manufacturing(178); Soap and other detergent manufacturing(179); Polish and other sanitation good manufacturing(180); Surface active agent manufacturing(181); Toilet preparation manufacturing (182); Printing ink manufacturing(183); Explosives manufacturing(184); Custom compounding of purchased resins(185); Photographic film and chemical manufacturing(186); Other miscellaneous chemical product manufacturing(187); Plastics packaging materials and unlaminated film and sheet manufacturing (188); Unlaminated plastics profile shape manufacturing (189); Plastics pipe and pipe fitting manufacturing(190); Laminated plastics plate, sheet (except packaging), and shape manufacturing (191); Polystyrene foam product manufacturing(192); Urethane and other foam product (except polystyrene) manufacturing(193); Plastics bottle manufacturing (194); Other plastics product manufacturing(195); Tire manufacturing(196); Rubber and plastics hoses and belting manufacturing(197); Other rubber product manufacturing(198)
GLASS, STONE, AND CLAY	Pottery, ceramics, and plumbing fixture manufacturing(199); Brick, tile, and other structural clay product manufacturing(200); Flat glass manufacturing(201); Other pressed and blown glass and glassware manufacturing(202); Glass container manufacturing (203); Glass product manufacturing made of purchased glass (204); Cement manufacturing(205); Ready-mix concrete manufacturing(206); Concrete block and brick manufacturing(207); Concrete pipe manufacturing(208); Other concrete product manufacturing(209); manufacturing(210); Gypsum product manufacturing(211); Abrasive product manufacturing(212); Cut stone and stone product manufacturing(213); Ground or treated mineral and earth manufacturing(214); Mineral wool manufacturing(215); Miscellaneous nonmetallic mineral product manufacturing(216)

Table A.1. Aggregation scheme of commercial sectors used for IMPLAN input-output analysis of the forest products industry contribution to the Mississippi economy, 2014 (continued).

MODEL SECTORS	ORIGINAL IMPLAN SECTORS
METAL INDUSTRIES	Iron and steel mills and ferroalloy manufacturing(217); Iron, steel pipe and tube manufacturing from purchased steel(218); Rolled steel shape manufacturing(219); Steel wire manufacturing(220); Alumina refining and primary aluminum production(221); Secondary smelting and alloying of aluminum(222); Aluminum sheet, plate, and foil manufacturing(223); Other aluminum rolling, drawing and extruding(224); Nonferrous metal (exc aluminum) smelting and refining(225); Copper rolling, drawing, extruding and alloying(226); Nonferrous metal, except copper and aluminum, shaping(227); Secondary processing of other nonferrous metals(228); Ferrous metal foundries(229); Nonferrous metal foundries(230); Iron and steel forging(231); Nonferrous forging(232); Custom roll forming(233); Crown and closure manufacturing and metal stamping (234); Cutlery, utensil, pot, and pan manufacturing(235); Handtool manufacturing(236); Prefabricated metal building and components manufacturing(237); Fabricated structure metal manufacturing(238); Plate work manufacturing(239); Metal window and door manufacturing(240); Sheet metal work manufacturing(241); Ornamental and architectural metal work manufacturing(242); Power boiler and heat exchanger manufacturing(243); Metal tank (heavy gauge) manufacturing(244); Metal can manufacturing(245); Metal barrels, drums and pails manufacturing(246); Hardware manufacturing(247); Spring and wire product manufacturing(248); Machine shops(249); Turned product and screw, nut, and bolt manufacturing(250); Metal heat treating(251); Metal coating and nonprecious engraving(252); Electroplating, anodizing, and coloring metal(253); Valve and fittings, other than plumbing, manufacturing(254); Plumbing fixture fitting and trim manufacturing(255); Ball and roller bearing manufacturing(256); Small arms ammunition manufacturing(257); Ammunition, except for small arm, manufacturing(258); Small arms, ordnance, and accessories manufacturing(259); Fabricated pipe and pipe fitting manufacturing(260); Other fabricated metal manufacturing(261)

Table A.1. Aggregation scheme of commercial sectors used for IMPLAN input-output analysis of the forest products industry contribution to the Mississippi economy, 2014 (continued).

MODEL SECTORS	ORIGINAL IMPLAN SECTORS
MACHINERY AND EQUIPMENT	<p>Construction machinery manufacturing(264); Mining machinery and equipment manufacturing(265); Oil and gas field machinery and equipment(266); Food product machinery manufacturing(267); Semiconductor machinery manufacturing(268); Sawmills, woodworking, and paper machinery(269); Printing machinery and equipment manufacturing(270); All other industrial machinery manufacturing(271); Optical instrument and lens manufacturing(272); Other commercial and service industry machinery manufacturing(274); Air purification and ventilation equipment manufacturing(275); Heating equipment (except warm air furnaces) manufacturing (276); Air conditioning, refrigeration, and warm air heating equipment manufacturing(277); Industrial mold manufacturing(278); Special tool, die, jig, and fixture manufacturing(279); Cutting tool and machine tool accessory manufacturing(280); Machine tool manufacturing(281); Rolling mill and other metalworking machinery manufacturing(282); Turbine and turbine generator set units manufacturing(283); Speed changer, industrial high-speed drive, and gear manufacturing(284); Mechanical power transmission equipment manufacturing(285); Other engine equipment manufacturing(286); Pump and pumping equipment manufacturing(287); Air and gas compressor manufacturing(288); Measuring and dispensing pump manufacturing(289); Elevator and moving stairway manufacturing(290); Conveyor and conveying equipment manufacturing(291); Overhead cranes, hoists, and monorail systems manufacturing(292); Industrial truck, trailer, and stacker manufacturing(293); Power-driven handtool manufacturing(294); Welding and soldering equipment manufacturing(295); Packaging machinery manufacturing(296); Industrial process furnace and oven manufacturing(297); Fluid power cylinder and actuator manufacturing(298); Fluid power pump and motor manufacturing(299); Scales, balances, and miscellaneous general purpose machinery manufacturing(300); Electric lamp bulb and part manufacturing (325); Lighting fixture manufacturing(326); Small electrical appliance manufacturing(327); Household cooking appliance manufacturing(328); Household refrigerator and home freezer manufacturing(329); Household laundry equipment manufacturing(330); Other major household appliance manufacturing(331); Power, distribution, and specialty transformer manufacturing (332); Motor and generator manufacturing(333); Switchgear and switchboard apparatus manufacturing (334); Relay and industrial control manufacturing(335); Storage battery manufacturing (336); Primary battery manufacturing(337); Fiber optic manufacturing(338); Other communication and energy wire manufacturing(339); Wiring device manufacturing(340); Carbon and graphite product manufacturing(341); All other miscellaneous electrical equipment and component manufacturing(342)</p>

Table A.1. Aggregation scheme of commercial sectors used for IMPLAN input-output analysis of the forest products industry contribution to the Mississippi economy, 2014 (continued).

MODEL SECTORS	ORIGINAL IMPLAN SECTORS
TRANSPORTATION EQUIPMENT	Automobile manufacturing(343); Light truck and utility vehicle manufacturing(344); Heavy duty truck manufacturing(345); Motor vehicle body manufacturing (346); Truck trailer manufacturing(347); Motor home manufacturing(348); Travel trailer and camper manufacturing(349); Motor vehicle gasoline engine and engine parts manufacturing (350); Motor vehicle electrical and electronic equipment manufacturing(351); Motor vehicle steering, suspension component (except spring), and brake systems manufacturing(352); Motor vehicle transmission and power train parts manufacturing(353); Motor vehicle seating and interior trim manufacturing(354); Motor vehicle metal stamping(355); Other motor vehicle parts manufacturing(356); Aircraft manufacturing(357); Aircraft engine and engine parts manufacturing(358); Other aircraft parts and auxiliary equipment manufacturing(359); Propulsion units and parts for space vehicles and guided missiles manufacturing (361); Railroad rolling stock manufacturing (362); Ship building and repairing(363); Boat building(364); Motorcycle, bicycle, and parts manufacturing(365); All other transportation equipment manufacturing(367)
TECHNOLOGY INDUSTRIES	Photographic and photocopying equipment manufacturing(273); Electronic computer manufacturing(301); Computer storage device manufacturing(302); Computer terminals and other computer peripheral equipment manufacturing(303); Telephone apparatus manufacturing(304); Broadcast and wireless communications equipment manufacturing(305); Other communications equipment manufacturing(306); Audio and video equipment manufacturing(307); Bare printed circuit board manufacturing(308); Semiconductor and related device manufacturing(309); Capacitor, resistor, coil, transformer, and other inductor manufacturing(310); Electronic connector manufacturing(311); Printed circuit assembly (electronic assembly) manufacturing(312); Other electronic component manufacturing(313); Electromedical and electrotherapeutic apparatus manufacturing(314); Search, detection, and navigation instruments manufacturing(315); Automatic environmental control manufacturing(316); Industrial process variable instruments manufacturing(317); Totalizing fluid meters and counting devices manufacturing(318); Electricity and signal testing instruments manufacturing(319); Analytical laboratory instrument manufacturing(320); Irradiation apparatus manufacturing(321); Blank magnetic and optical recording media manufacturing(323); Software and other pre-recorded and record producing(324); Guided missile and space vehicle manufacturing(360); Military armored vehicle, tank, and tank component manufacturing(366); Surgical and medical instrument manufacturing(379); Surgical appliance and supplies manufacturing(380); Dental equipment and supplies manufacturing(381); Ophthalmic goods manufacturing(382); Dental laboratories(383)
TRANSPORTATION AND COMMUNICATION SERVICES	Air transportation(408); Rail transportation(409); Water transportation(410); Truck transportation(411); Transit and ground passenger transportation(412); Pipeline transportation(413); Scenic and sightseeing transportation and support activities for transportation(414)

Table A.1. Aggregation scheme of commercial sectors used for IMPLAN input-output analysis of the forest products industry contribution to the Mississippi economy, 2014 (continued).

MODEL SECTORS	ORIGINAL IMPLAN SECTORS
MISCELLANEOUS MANUFACTURING	<p>Nonwoven fabric mills(115); Knit fabric mills(116); Fabric coating mills(118); Carpet and rug mills(119); Curtain and linen mills(120); Textile bag and canvas mills(121); Rope, cordage, twine, tire cord and tire fabric mills(122); Other textile product mills(123); Hosiery and sock mills(124); Other apparel knitting mills(125); Cut and sew apparel contractors(126); Men's and boys' cut and sew apparel manufacturing(127); Women's and girls' cut and sew apparel manufacturing(128); Other cut and sew apparel manufacturing(129); Apparel accessories and other apparel manufacturing(130); Footwear manufacturing(132); Manufactured home (mobile home) manufacturing(143); Printing(154); Support activities for printing(155); Watch, clock, and other measuring and controlling device manufacturing(322); Other household non-upholstered furniture manufacturing(371); Institutional furniture manufacturing (372); Office furniture, except, wood, manufacturing(375); Showcase, partition, shelving, and locker manufacturing(376); Mattress manufacturing(377); Blind and shade manufacturing(378); Jewelry and silverware manufacturing(384); Sporting and athletic goods manufacturing(385); Doll, toy, and game manufacturing(386); Office supplies (except paper) manufacturing(387); Sign manufacturing(388); Gasket, packing, and sealing device manufacturing(389); Musical instrument manufacturing(390); Fasteners, buttons, needles, and pins manufacturing(391); Broom, brush, needles, and pins manufacturing(392); Burial casket manufacturing(393); All other miscellaneous manufacturing(394); Couriers and messengers(415); Accounting, tax preparation, bookkeeping, and payroll services(448); Architectural, engineering, and related services(449); Specialized design services(450); Custom computer programming services(451); Computer systems design services(452); Other computer related services, including facilities management(453); Management consulting services(454); Environmental and other technical consulting services(455); Scientific research and development services(456); Advertising, public relations, and related services(457); Photographic services(458); Veterinary services (459); Marketing research and all other miscellaneous professional, scientific, and technical services(460); Management of companies and enterprises(461); Office administrative services(462); Facilities support services(463); Employment services (464); Business support services(465); Travel arrangement and reservation services(466); Investigation and security services(467); Services to buildings (468); Landscape and horticulture services(469); Private household (517)</p>
UTILITY SERVICES	<p>Electric power generation – Hydroelectric(41); Electric power generation –Fossil fuel(42); Electric power generation – Nuclear(43); Electric power generation – Solar(44); Electric power generation – Wind(45); Electric power generation – Geothermal(46); Electric power generation – Biomass(47); Electric power generation – All other(48); Electric power transmission and distribution(49); Natural gas distribution(50); Water, sewage and other systems(51); Waste management and remediation services(471)</p>

Table A.1. Aggregation scheme of commercial sectors used for IMPLAN input-output analysis of the forest products industry contribution to the Mississippi economy, 2014 (continued).

MODEL SECTORS	ORIGINAL IMPLAN SECTORS
WHOLESALE AND RETAIL TRADE	Wholesale trade businesses(395); Retail Stores - Motor vehicle and parts(396); Retail - Furniture and home furnishings stores(397); Retail - Electronics and appliances stores(398); Retail - Building material and garden supplies stores(399); Retail - Food and beverage stores(400); Retail - Health and personal care stores(401); Retail - Gasoline stores(402); Retail - Clothing and clothing accessories stores(403); Retail - Sporting goods, hobby, musical instrument and book(404); Retail - General merchandise stores(405); Retail – Miscellaneous store retailers(406); Retail – Nonstore retailers(407); Warehousing and store(416); Newspaper publishers(417);Periodical publishers(418); Book publishers(419); Directory, mailing list, and other publishers(420); Greeting card publishing(421); Software publishers(422); Sound recording industries(424)
FINANCIAL AND REAL ESTATE	Monetary authorities and depository credit intermediation(433); Nondepository credit intermediation and related activities(434); Securities and commodity contracts intermediation and brokerage(435); Other financial investment activities(436); Insurance carriers(437); Insurance agencies, brokerages, and related activities(438); Funds, trusts, and other financial vehicles(439); Real estate establishments(440)
MISCELLANEOUS SERVICES	Data processing, hosting, and related services(430); News syndicates, libraries, archives and all other information services(431); Legal services(447); Other support services(470); Nursing and community care facilities(483); Residential mental retardation, mental health, substance abuse and other facilities(484); Individual and family services(485); Community food, housing, and other relief services, including rehabilitation services(486); Child day care services(487); Hotels and motels, including casino hotels (499); Other accommodations(500); Full-service restaurants(501); Limited-service restaurants(502); All other food services and drinking places(503); Automotive repair and maintenance, except car washes(504); Car washes(505); Electronic and precision equipment repair and maintenance(506); Commercial and industrial machinery and equipment repair and maintenance(507); Personal and household goods repair and maintenance(508); Personal care services(509); Death care services(510); Dry-cleaning and laundry services(511); Other personal services(512); Religious organizations(513); Grant-making, giving, and social advocacy organizations(514); Business and professional associations(515); Labor and civic organizations(516)
RECREATION AND AMUSEMENT	Motion picture and video industries(423); Performing arts companies(488); Commercial Sports Except Racing(489); Racing and Track Operation(490); Promoters of performing arts and sports and agents for public figures(491); Independent artists, writers, and performers(492); Museums, historical sites, zoos, and parks(493); Amusement parks and arcades(494); Gambling industries(except casino hotels)(495); Other amusement and recreation industries(496); Fitness and recreational sports centers(497); Bowling centers(498)
HEALTH SERVICES	Offices of physicians(475); Offices of dentists(476); Offices of other health practitioners(477); Outpatient care centers(478); Medical and diagnostic laboratories(479); Home health care services(480); Other ambulatory health care services(481); Hospitals(482)

Table A.1. Aggregation scheme of commercial sectors used for IMPLAN input-output analysis of the forest products industry contribution to the Mississippi economy, 2014 (continued).

MODEL SECTORS	ORIGINAL IMPLAN SECTORS
EDUCATION	Elementary and secondary schools(472); Junior colleges, colleges, universities, and professional schools(473); Other educational services(474); Employment and payroll of state govt education(532); Employment and payroll of local govt education(534)
GOVERNMENT	Postal Service(518); Federal electric utilities(519); Other federal government enterprises(520); State government passenger transit(521); State government electric utilities(422); Other state government enterprises(523); Local government passenger transit(524); Local government electric utilities(525); Other local government enterprises(526); Employment and payroll of state govt, non-education(531); Employment and payroll of local govt, non-education(533); Employment and payroll of federal govt, non-military(535); Employment and payroll of federal govt, education(536)
DOMESTIC SERVICES	Radio and television broadcasting(425); Cable and other subscription programming(426); Wired telecommunication carriers(427); Wired telecommunication carriers (except satellite) (428); Satellite, telecommunications resellers, and all other telecommunications(429); Internet publishing and broadcasting and web service portals(432); Automotive equipment rental and leasing(442); General and consumer goods rental except video tapes and discs(443); Video tape and disc rental(444); Commercial and industrial machinery and equipment rental and leasing(445); Lessors of nonfinancial intangible assets(446)
BALANCE	Owner-occupied dwellings(441); Used and secondhand goods(527); Scrap(528); Rest of the world adjustment(529); Noncomparable imports(530)



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