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Forest Sector and Primary Forest Products Industry Contributions to the Economies of the Southern States: 2011 Update

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The analysis in this article provides an update on the southern forest sector economic activity after the downturn experienced in 2008–2009. The analysis was conducted using Impact Analysis for Planning (IMPLAN) software and data sets for 2009 and 2011 and results from the USDA Forest Service Timber Products Output latest survey of primary wood processing mills. Although improving economic conditions are reflected by increased mill roundwood consumption during 2011, the forest industry's economic contribution improved slightly but not across all states. At the regional scale, the sector displayed a downward trend in employment, value added, and number of active primary mills.

Keywords: southern forest products industry, economic contribution, economic contribution, timber harvest, North American Industry Classification System (NAICS)

The southern forest products sector makes significant contributions to the economies of the southern states and the United States. The southern region (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia) holds close to 41% of the US timberland and 32% of the growing stock volume (Miles 2014) and supplies more than half of the US roundwood products (USDA Forest Service 2014). The recent US economic downturn, prompted by the burst of the housing bubble and the global economic slowdown, affected the forest sector significantly. Lumber consumption declined by 49%, as construction activity fell from a peak in 2005 to the lowest level observed over past decades in 2009. During the 2005–2009 period, housing starts dropped from a high of >2 million units to a low of 554,000 units (Census Bureau 2014). As a result, the forest sector experienced considerable employment loss and lower industrial output, as well as widespread closures of primary wood-using mills.

Economic indicators for 2011, however, pointed to a recovering economy: gross domestic product (GDP) grew 4.4% (Bureau of Economic Analysis 2014), unemployment decreased by 0.4% (Bureau of Labor Statistics 2014), and housing starts rose 3.7% (Census Bureau 2014). The positive economic signs indicate likely improvements to the southern forest products industries as well. To examine the recovery of both forest sector and primary forest industries in the southern states, we estimated the corresponding economic contributions for 2011, drawing comparisons to 2009 figures. Information on the economic contribution of forest industries and trends in roundwood consumption before and through the recession can be found in Hodges et al. (2012) and Brandeis et al. (2012).

Data Sources and Methodology

We conducted two analyses, one estimating the economic contribution of the forest sector and one estimating the contribution of a subset of industries comprising primary forest products mills. Primary mills use logs, either whole or chipped, to generate a primary product such as lumber, veneer, or wood pulp. The USDA Forest Service Forest Inventory and Analysis Timber Products Output (TPO) program for the southern region performs biennial surveys of primary mills. The information, collected for all primary mills operating during a survey period, is used to determine the amount and flow of harvested wood. Isolating the economic contribution of primary industries allowed us to associate economic effects with mill information available from TPO.

We estimated economic contributions using the Impact Analysis for Planning (IMPLAN) software, an input-output model system widely used to estimate economic impacts (IMPLAN Group, LLC 2011).

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The forest sector contribution was evaluated using IMPLAN data sets for 2009 and 2011. To assess the contribution from primary industries, we ran IMPLAN using employment numbers available from TPO data. For reporting purposes, we aggregated the forest sector industries into five categories: forestry, logging, wood products, pulp and paper products, and furniture. We report primary industry results aggregated into the primary wood industry (mills using logs to generate a durable product such as lumber or composite panels and nondurable products such as wood pellets) and primary pulp industry (mills using logs, whole or chipped, to produce wood pulp). The list of industries included for each case, input values used with IMPLAN and reporting aggregation schemes are provided as Supplemental Tables S1 and S2.[S] Results provided include those associated with activity by the forest industries (IMPLAN's direct effects) and the total economic contribution resulting from that activity (IMPLAN's total effects). We provide estimates for employment (number of full-time and part-time jobs), labor income (wages and salaries), and value added (contribution to the gross domestic product). Detailed IMPLAN results are provided as Supplemental Tables S3 and S4. Unless otherwise noted, the indicated changes refer to 2011 data compared with numbers observed during 2009. All monetary values are expressed in 2013 dollars.

Results

Economic Contribution of the Forest Sector

The total economic contribution of the forest sector amounted to nearly 2% of the South's gross regional product (GRP). The percentage of total value added contributed by the forest sector to the GRP of the southern states ranged from <1% in Florida, Oklahoma, and Texas to >4% in Alabama, Arkansas, and Mississippi (Figure 1). The sector's direct and total contributions displayed a further decline during 2011, although with varying degrees across industry categories (Table 1). The sector's total value added decreased by 9% and direct employment fell by 4%. Forestry and logging displayed the most significant change in both employment and value added.

Industries displayed various degrees of recovery across the southern states (Figure 2). Logging, forestry, and wood products industries showed the slower recovery with most states displaying a negative change in value added. Pulp and paper and furniture industries displayed increasing or stable values across most of the region. North Carolina, Tennessee, Texas, and Virginia experienced a negative change in value added across most industry groups.

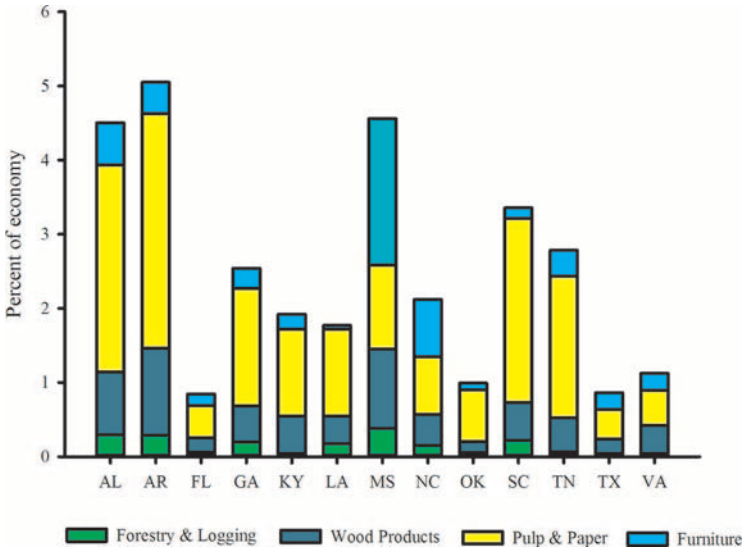

Figure 1. Percentage of total value added contributed by the forest sector to the southern states GRP, 2011.

Primary Wood and Primary Pulp Industry

The primary industry displayed a downward trend, with negative percentage changes on employment, labor income, and value added (Table 2). The drop in employment and labor income was significantly higher in the primary pulp and paper industries. The percent change in employment varied across states (Figure 3). Most of the employment change in the primary pulp industry resulted from the closure of two International Paper Company mills: the mill in Pineville, Louisiana, which closed at the end of 2009, and the mill in Isle of Wight, Virginia, which closed during 2010. A few states experienced gains in employment, occurring mostly within the primary wood industry.

The number of operating primary mills contracted by 7%, a moderate fall compared with the mill losses reported over the 2007–2009 period (Table 3). The sawmill industry experienced the largest drop in mill numbers, with losses occurring across most states (Figure 4). Exceptions included Arkansas and Georgia, where sawmill numbers increased slightly, and Louisiana, where sawmill numbers remained stable. Texas and Oklahoma experienced the largest percentages of change (35 and 23% decreases, respectively).

TPO reports operation capacity for pulp mills; capacity for other primary mills is reported based on volume received, as southern TPO does not collect their capacity information. As such, a significant portion of the sawmill losses occurred within the smaller mill size category (mills receiv-

Management and Policy Implications

The information provided should assist forest landowners and policymakers assessing the forest products sector's economic growth and recovery after the latest recession of 2008–2009. The article reports the estimated economic contribution of forest product industries to the economies of the southern states, providing policymakers with valuable information to help guide future actions affecting the industry. Results indicate a slowly recovering industry with decreasing jobs and productivity (value added per worker) among most southern states. The latest survey of primary wood-using mills, however, revealed increasing roundwood consumption, a positive sign to timberland owners.

[S] Supplementary data are available with this article at http://dx.doi.org/10.5849/jof.14-054.

Table 1. Direct and total economic contributions of the forest sector, 2009 and 2011.

Impact type/industry group	Employment			Labor income			Value added		
	2009	2011	Change (%)	2009	2011	Change (%)	2009	2011	Change (%)
	. . .(thousand jobs). . .			. . .(billion $). . .			. . .(billion $). . .		
Direct effect									
Forestry	8.2	7.3	−11	0.5	0.4	−3	1.4	0.9	−34
Logging	51.5	47.9	−7	2.4	2.2	−7	2.6	2.0	−24
Wood products	154.9	150.8	−3	7.4	7.3	−2	11.2	9.6	−15
Pulp and paper products	145.8	143.2	−2	13.2	12.6	−4	25.1	25.2	1
Furniture	131.5	123.8	−6	5.9	6.2	5	8.4	8.2	−2
Direct effect total	491.9	473.1	−4	29.4	28.7	−2	48.8	46.0	−6
Total effect									
Forestry	40.8	33.6	−18	1.6	1.3	−18	2.9	2.0	−30
Logging	79.6	67.3	−15	3.5	3.0	−16	4.6	3.3	−28
Wood products	271.0	262.9	−3	12.9	12.4	−3	20.6	18.3	−11
Pulp and paper products	453.7	417.3	−8	28.5	25.9	−9	51.6	47.7	−8
Furniture	231.7	219.6	−5	10.5	10.4	0	16.4	15.7	−4
Total effect total	1,076.8	1,000.7	−7	56.9	53.0	−7	96.2	87.0	−9

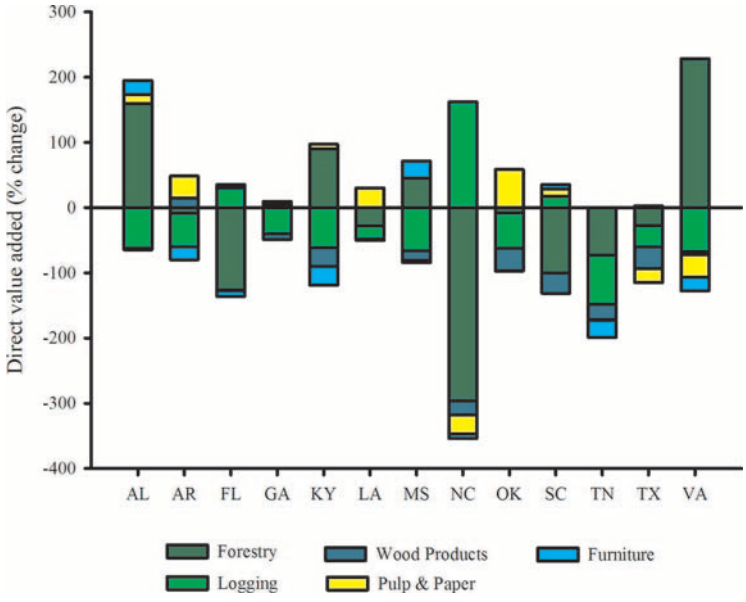

Figure 2. Percent change in direct value added by forest sector industries across the southern states, 2009–2011.

ing < 1 million board feet per year). The loss of veneer and plywood mills occurred across medium and large size mills (mills receiving ≥5 million board feet). The region's overall pulp mill capacity declined slightly (1%), but the capacity change varied across states as shown in Table 4. The loss in capacity, resulting primarily from the two mill closures mentioned previously, was offset by capacity increases, mostly by Alabama mills. Despite the drop in mill numbers, roundwood consumption increased by >10%, for a combined 7.25 billion cubic feet of mill receipts. Receipts remained well under the peak 8.67 billion cubic feet observed in 2005, however.

Other Sources of Wood Demand

In addition to the volume consumed by local mills, southern timberlands supplied close to 24.4 million cubic feet of logs for export (not including volume of exports reported on a number of logs basis). Major consumers of southern logs included China (35%), Germany (12%), and Italy (7%) (Foreign Agricultural Service 2014). A net 2.5 million cubic feet of roundwood produced in the region was consumed by mills in other US regions.

Traditional use of mill residues as primary inputs placed wood pellet mills outside the range of mills surveyed by TPO. However, increasing wood pellet production is resulting in rising use of roundwood inputs. As a result, the southern TPO survey is currently collecting production information from some wood pellet mills. Data collected, however, are aggregated and reported under TPO's other industrial products category. The rapid growth experienced by the US wood pellet sector is fueled largely by increasing demand from European markets. From 2009 to 2011, the US wood pellet exports to Europe increased by 87%, from 0.59 to 1.1 million tons (Eurostat 2014). Based on capacity information obtained from the Biomass Magazine (2014) and Wood2Energy (2014) databases, we estimated that the southern region possessed more than one-third of the US pellet mill capacity during 2009. Estimates place the southern wood pellet capacity increasing by >78% between 2009 and 2011, from approximately 2.3 to 4.1 million tons. Activity by the wood pellet is not reported as an individual North American Industry Classification System (NAICS) sector; therefore, we are unable to report a disaggregated economic contribution.

The Forest Sector in 2012 and Economic Outlook for 2013

During 2012, the US economy maintained the upward trend observed during the previous year, although at a slower pace. National GDP increased by 2.8% (Bureau of Economic Analysis 2014) and unemployment dropped by 0.8% (Bureau of Labor Statistics 2014). Industries across the forest sector continued a downward trend in employment, but direct value added trended up.

The main markets for wood products continued recovering. Across the US, the sale of new houses increased by 20% and single unit building permits rose by 24% (Census Bureau 2014). Southern production of softwood lumber increased by 6% (Western Wood Products Association 2013),

Table 2. Direct and total economic contributions of primary industry, 2009 and 2011.

Impact type	Employment			Labor income			Value added		
	2009	2011	Change (%)	2009	2011	Change (%)	2009	2011	Change (%)
	. .(thousand jobs). .			. . .(billion $) . . .			. . .(billion $) . . .		
Direct effect									
Primary wood products	43.5	41.7	−4	2.2	2.2	−2	3.2	3.1	−4
Primary pulp and paper	49.4	45.8	−7	5.9	5.2	−11	2.5	11.8	−5
Direct effect total	92.9	87.5	−6	8.1	7.4	−9	15.7	14.9	−5
Total effect									
Primary wood products	77.9	75.5	−3	3.8	3.7	−3	6.0	5.7	−4
Primary pulp and paper	204.8	178.4	−13	13.5	11.5	−14	25.8	22.6	−12
Total effect total	282.7	253.9	−10	17.3	15.2	−12	31.8	28.3	−11

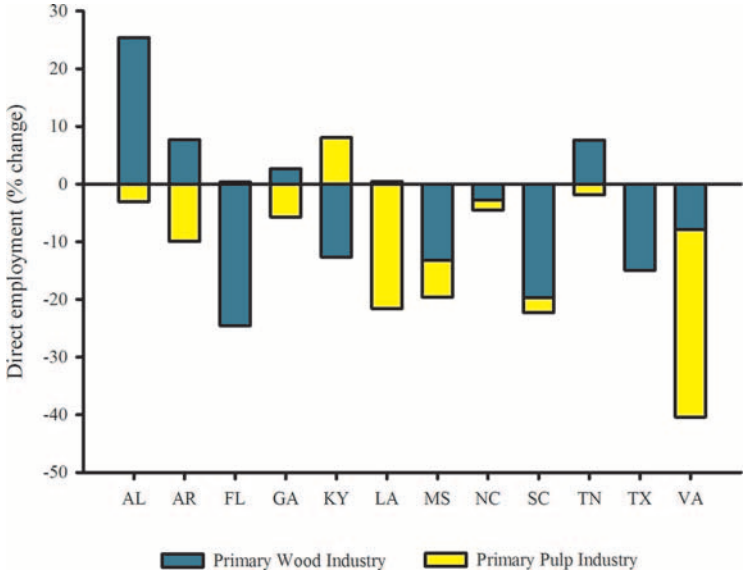

Figure 3. Percentage change on direct employment in the primary industry, 2009–2011. Note: We excluded Oklahoma's pulp industry from the graph to avoid releasing individual mill data.

Table 3. Number of southern primary forest products mills by mill type and year, 1999–2011.

Mill type	Year						Change 2009–2011
	1999	2003	2005	2007	2009	2011	
	. . . . . .(no.)						
Sawmills	2,165	1,896	1,669	1,540	1,216	1,119	−97
Pulp mills	97	91	87	87	83	81	−2
Veneer mills	124	107	99	87	66	60	−6
Composite	24	29	30	27	24	23	−1
Other mills	141	158	143	141	140	133	−7
Total	2,551	2,281	2,028	1,882	1,529	1,416	−113

and log exports increased by 18% to >28.3 million cubic feet (considering only log exports reported by volume) (Foreign Agricultural Service 2014). Export of wood pellets continued trending upward, with US exports to the European Union increasing by 79% (Eurostat 2014). The region's 2012 wood pellets exports reached 2 million tons, with the European Union remaining the primary market and The Netherlands, United Kingdom, and Belgium the largest importers (International Trade Administration 2014).

Economic growth slowed in 2013 to a 1.9% increase in GDP (Bureau of Economic Analysis 2014). Unemployment for November 2013 declined by 0.6% compared with that for the previous year (Bureau of Labor Statistics 2014). As of November 2013, US sales of new houses stood 18% above that from the previous November. Building permits for new privately owned housing units increased 8%. Housing starts in November 2013 were almost 30% higher than in November 2012 (Census Bureau 2014). Lumber production was up 5% compared with that for the previous year (Random Lengths 2014). Production of wood pellets for the export market continued to rise, with exports from southern ports increasing by 58% to >3 million tons (International Trade Administration 2014).

Conclusions

Despite the positive economic signs of 2011, the southern forest sector and primary industries sustained further decline. A number of factors are contributing to the lingering recovery. A slow recovering housing market, which grew slightly between 2009 and 2011, dampened the demand for wood products. At the same time, falling demand for paper for print, as the use of electronic communications grows, continues to pressure the pulp and paper industry. In fact, the declines in employment, labor income, and value added were larger for the primary pulp and paper industry than those reported for primary wood products. Southern industries also face increasing competition from foreign producers with competitive advantages such as lower labor costs. Growing log exports, although a market for timberland owners and loggers, offer little to the forest sector's growth.

The increased roundwood consumption by the primary industry, however, indicates growing confidence in future wood products demand. The observed sustained improvement of the housing market, growing wood pellets industry, and slowly improving global economy offer positive prospects for the forest sector and the economies of the southern states. The observed downward trends in the logging industry could affect the ability of the primary indus-

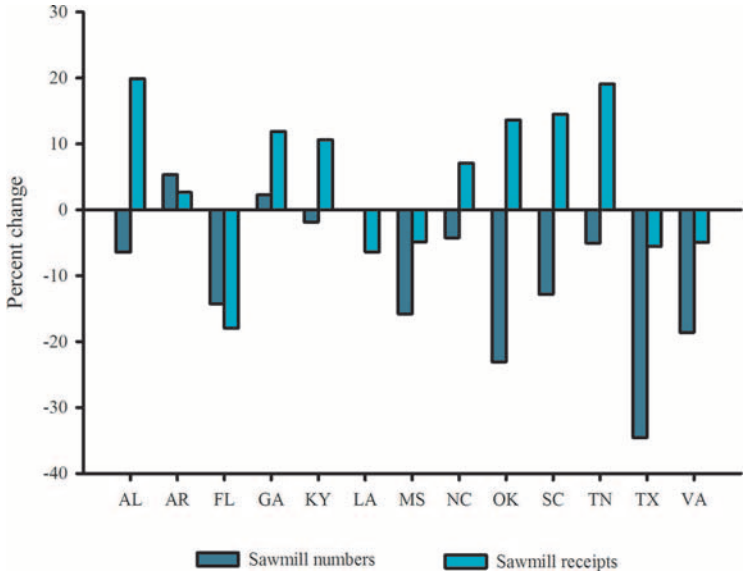

Figure 4. Percentage change in number of sawmills and volume of sawmill receipts across the southern states, 2009–2011.

Table 4. Number of operating pulp mills and capacity by state, 2009 and 2011.

State	Number of pulp mills			24-hr pulping capacity		
	2009	2011	Change	2009	2011	Change
				(tons)		
Alabama	13	13	0	20,653	22,722	2,069
Arkansas	6	6	0	7,720	7,800	80
Florida	6	6	0	8,663	8,663	0
Georgia	12	12	0	20,712	20,779	67
Kentucky	2	2	0	2,250	2,250	0
Louisiana	8	7	−1	14,785	13,208	−1,577
Mississippi	5	5	0	8,054	7,704	−350
North Carolina	6	6	0	8,220	8,270	50
Oklahoma	1	1	0	2,075	1,582	−493
South Carolina	7	7	0	10,183	10,183	0
Tennessee	5	5	0	4,875	5,405	530
Texas	4	4	0	5,883	6,078	195
Virginia	8	7	−1	9,295	7,574	−1,721
Total	83	81	−2	123,368	122,218	−1,150

Source: Johnson and Steppleton (2011) and Bentley and Steppleton (2013).

try to respond to improving wood market demands, however. Although increasing roundwood demand should encourage expansion of active logging firms as well as new entries, issues such as high investment for required equipment and wood market uncertainties will probably limit loggers' responses. Past research has highlighted this potential problem as well (Conrad et al. 2010). Future research should explore patterns of logging productivity and capacity across the southern states to further evaluate the extent of these issues.

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