

Forest Products Industry Size and Economic Multipliers in the US South

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Abstract

The forest products industry (FPI) is an important component of local, state, regional, and national economies. Thus, assessing its economic contribution can provide valuable information to policymakers and forestry interests. IMPLAN, an input–output model, was used to assess the economic contribution of the FPI in 13 US southern states for the year 2009, individually as well as regionally, and to compare it with that in 2001, the last comprehensive study of the industry in the South. Two aspects of economic contribution, direct impacts and associated economic multipliers, were estimated for three primary FPI sectors (lumber and wood products, paper and allied products, and wood furniture). The FPI in the South employed 470,000 individuals and generated \$133 billion of gross output. The industry’s employment decreased by 33.9 percent while gross output increased by 15.1 percent between 2001 and 2009. Study findings reveal that the FPI reduced employment relative to total industry output to maintain production during the recession period providing evidence of capital substitution for labor. This implies that despite the disproportionate impacts of the great recession of the 2000s, the industry is still an important component of the South’s economy. Thus, this article will provide insights about how the economic contribution of the FPI changes over time. In addition, results of this study will be helpful in identifying important industry shifts and help formulate policies and regulations to support the FPI.

Historically, forests provided fuel-wood, timber products, materials for agricultural activities and construction, and land for settlement. Even today, with the development of a value-added forest products sector (e.g., lumber manufacturing, paper and paper board manufacturing), forests continue to contribute to economic development by creating jobs and incomes. Throughout history, forests have always supported local, state, regional, and national economies and generated employment and earnings. In addition to more tangible benefits, forests also have non-market benefits such as ecosystem services, aesthetics, and recreational values.

The forest products industry (FPI) is one of the major contributors to employment in rural America (Alvarez 2007). In 2006, the US FPI (roundwood production, pulp and paper, and solid wood production) contributed about 1 percent to the global economy and generated 0.4 percent of jobs (Food and Agriculture Organization of the United Nations 2011). In 2007 about 47 percent of total harvesting was done for industrial purposes (Miner 2010). According to the Annual Survey of Manufacturers, in 2004 the US FPI (wood products manufacturing and paper product manufacturing) accounted for \$118 billion of value added, which increased to \$123 billion in 2007. The South composed 40.7 percent of this value added in 2007. Thus, the US FPI is

concentrated in the South (Abt et al. 2002). Forest resources are a major economic asset in this region, covering approximately 214 million acres (40%) of the total land area (Alig and Butler 2004). The South is one of the largest producers of timber products in the world (Prestemon and Abt 2002), and the regional economic impacts of the FPI in this region are larger than those in the Pacific Northwest (Cox and Munn 2001) with the South accounting for 57 percent of the US wood harvest in 2006 (Hanson et al. 2010). Given the importance of the FPI to the South, economic impacts of this industry have been evaluated with some regularity (e.g., Aruna et al. 1997, Abt et al. 2002, Tilley and Munn 2007, Hodges et al. 2011, Brandeis et al. 2012).

The South’s share of the wood products jobs in the United States increased from 36.5 to 39.3 percent between 1987

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and 1997 (Abt et al. 2002). Using 1992 IMPLAN data, Aruna et al. (1997) estimated the contribution of FPI to state and regional economies in the South in the early 1990s. Forest products industries accounted for 623,863 direct jobs and \$15.1 billion in employee compensation. Tilley and Munn (2007) updated the study using 2001 data. The authors reported the FPI accounted for \$27.5 billion in wages and salary, employing 712,142 people. Thus, the economic impact of the forest products industries in the South had increased substantially from 1990 to 2001. Given the dramatic changes that have occurred in the economy since 2001, such as the great recession and related sharp decline in the US housing market and its impact on the FPI, an updated analysis of the contribution of the FPI is necessary to accurately portray the role this industry now plays in the South and its member states.

Figure 1A shows the trend of the South gross domestic product (GDP) from 2001 to 2009 along with the GDP by the wood products sector (North American Industry Classification System [NAICS] 321) and paper product manufacturing sector (NAICS 322). Trends of the South GDP and the FPI diverged substantially suggesting some structural change in the economy. The South GDP increased until 2007 and then fell sharply. The FPI does not follow this trend (Fig. 1A). GDP trends for the United States and the South are closely aligned (Fig. 1B). Economic globalization, declining US consumption of paper and paperboard, and decline in housing starts were major reasons for the downturn (Ince and Nepal 2012). A sharp decline in housing starts (Fig. 2) resulted in a divergence between the regional GDP and the wood products manufacturing (NAICS 321) in the South. Divergence between paper products (NAICS 322) and the South GDP is due to numerous factors including displacement of domestic production by imports and increased usage of electronic media. Figure 3 illustrates the trend of employment between the South and United States. The unemployment trends are parallel to each other and sharply inclined after 2007. Decrease in GDP decreases consumers' confidence resulting in reduction in demand. To adjust with this low demand, the private sector lowered production and

shed workers as cost-cutting measures. Thus, the economic conditions between 2007 and 2009 resulted in one of the most pronounced recessions in modern US history.

To quantify the impact of the FPI, four key statistics can be measured: (1) employment, consisting of the number of full- and part-time jobs; (2) employee compensation in wages and salary payments as well as benefits such as health and life insurance, retirement payment, and other non-cash compensation; (3) output in the form of value of production by industry for a given time period; and (4) value added, the sum of employee compensation, proprietary income, property income, and indirect business taxes. Those key statistics influence the region's economy in three ways: direct, indirect, and induced effects.

Forest resources impact the economy at all levels, from wages and purchases in local economies to state-level payroll and income taxes. Given the relative importance of the forest products industry to both state and local economies, there is often great interest in quantifying the economic impacts of the FPI. Two aspects of economic contribution analyses that are particularly important to policymakers are the direct impacts and associated economic multipliers. Direct impacts reflect the magnitude or size of the industry's own economic activity. It is the initial jobs or dollar value that circulates throughout the economy. In other words, it is the measure of changes associated with the initial impact to the economy (Perez-Verdin et al. 2008). Multipliers capture the magnitude of the ripple effect that the direct impacts cause in the rest of the economy. Multipliers are designed to capture direct impacts and resulting indirect and induced impacts of the economic activity (Shields et al. 1996). Thus, the purpose of this study was to determine the direct economic contribution of the three major forest products industries—lumber and wood products, paper and allied products, and wood furniture—to the 13 southern states and the region and to determine the social accounting matrix (SAM) multipliers by state and region. The 13 southern states were Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia. The Type SAM multiplier represents the total

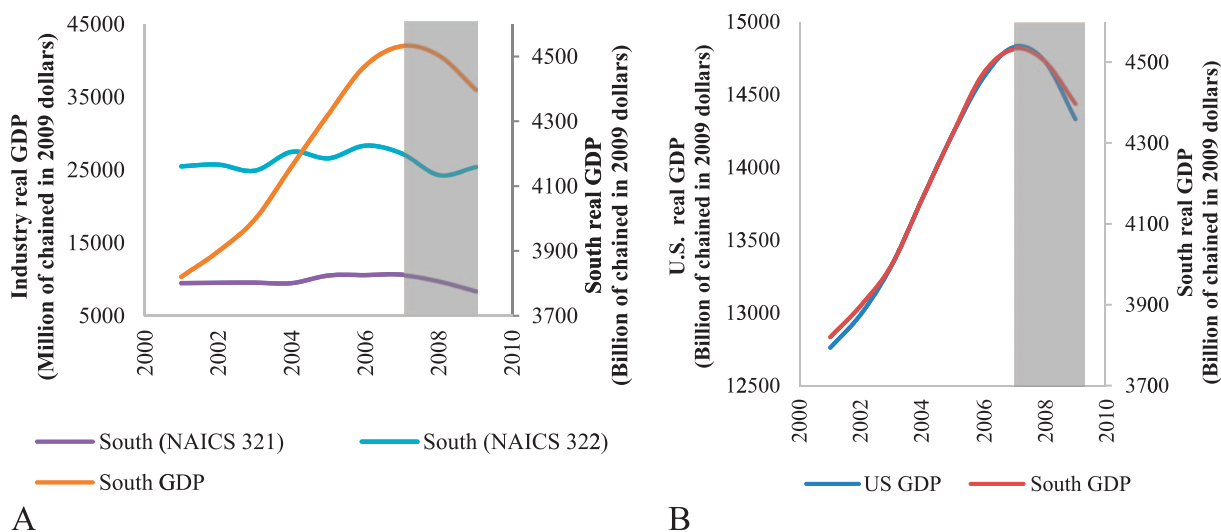


Figure 1.—Trends in real gross domestic product (GDP) from 2001 to 2009 of (A) the South's forest products industry and (B) the total GDP for the South and United States. NAICS = North American Industry Classification System. Data from the Bureau of Economic Analysis. (Color version is available online.)

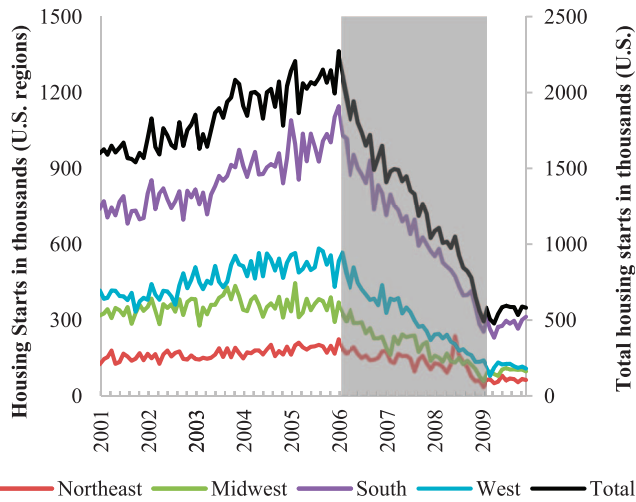


Figure 2.—Newly privately owned housing starts (quarterly). Data from the US Census Bureau. (Color version is available online.)

change in the economy divided by the change in the sector of interest (i.e., direct effect). The direct effects are changes in the industry being analyzed, the indirect effects are changes in inter-industry purchases that respond to changes from the direct effects, and induced effects are changes in household spending and spending in other institutions such as state and local government. This study examines Type SAM multipliers in which, unlike Type II multipliers, the induced effects are calculated based on the information obtained from the social account matrix (Lindall and Olson 1996). Because SAM multipliers account for social security and income tax leakages, institutional saving, and commuting (Lindall and Olson 1996), it is the most detailed multiplier associated with economic impact analysis. Results from this research will update baseline economic information about the FPI and provide indicators of important trends in the industry that can be used to guide planners and policymakers. Additionally, no previous study

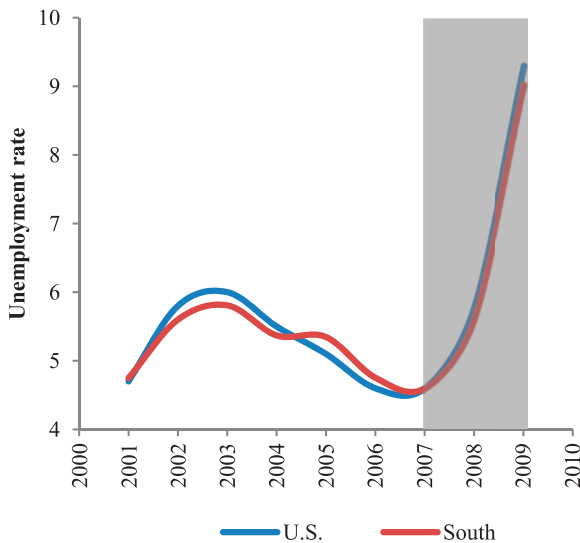


Figure 3.—Unemployment rate of the United States and South. Data from the Bureau of Labor Force Statistics. (Color version is available online.)

has examined the economic contribution of the FPI for a given region over more than one time period.

Materials and Methods

I-O model

The input–output (I-O) model, developed by Wassily Leontief in the 1930s, is a static model based on the concept of interindustry transactions. The I-O model describes mutual interrelationships among various sectors such as industries, households, and government entities (Leontief 1986, EMSI 2008) and is an important tool to assess economic impacts owing to any endogenous shock (e.g., changes in demand, supply, and government policies; Shaffer et al. 2004). IMPLAN is a nonsurvey-based computer software and modeling system that constructs regional economic accounts and regional I-O tables at flexible spatial scales (Shaffer et al. 2004, Tilley and Munn 2007). The model can be used to depict economic impacts of contributions by specific industries or activities to a specified economy by tracking the flow of money from sector to sector between industries, households, and the government.

The IMPLAN economic impact assessment software was originally developed by the USDA Forest Service and is now maintained by the Minnesota IMPLAN Group, Inc. (MIG 2004). The two major components of IMPLAN are the software and the annualized data. The current version of IMPLAN software is V.3.0. IMPLAN and its associated data sets are available at the zip code, county, state, and national level. Different data levels can be combined to generate regional impacts. Impacts are generated by multipliers and economic impacts are estimated in terms of direct, indirect, and induced impacts. Impacts include employment, total industry output, labor income, and value added. IMPLAN estimates impacts resulting from changes in industry activity, employment, income, or other economic activity. IMPLAN is now used in various fields to estimate economic impacts of activities in specified areas, regions, or even at the national level. IMPLAN can be used where there is flow of money from one industrial sector to another as in manufacturing and transporting industry, government projects, and industries related to natural resources. IMPLAN helps in visualizing the impacts that help in planning and diversifying the economy.

Data analysis

IMPLAN 2009 databases, the most recent data available when this study was begun, for the 13 southern states were obtained from MIG. For the construction of the models, the 2009 IMPLAN database was used and was measured in 2009 dollars. The sectors of interest and regions examined follow Tilley and Munn (2007). Data were analyzed with IMPLAN V.3.0 software using a 440-sector I-O transaction table based on NAICS. IMPLAN models were constructed for each of the 13 southern states and the region to generate the direct effects and SAM multipliers. Forest-related industries were aggregated, for reporting purposes, into three broad primary sectors: lumber and wood products, paper and allied products, and wood furniture (Table 1). Employment, wages and salaries, total industry output, value added, and associated SAM multipliers were derived for each of these categories for the three FPI sectors. IMPLAN built-in economic multipliers were used in assessing the industry's impacts. IMPLAN

Table 1.—IMPLAN sectors included in the aggregated forest products industry's three sectors.

| Aggregated forest products sectors | IMPLAN sectors (NAICS code) contained in the aggregated sector ^a |
|------------------------------------|--|
| Lumber and wood products | Logging (1133); sawmills and wood preservation (3211); veneer and plywood manufacturing (321211, 321212); engineered wood members and truss manufacturing (321213, 321214); reconstituted wood products manufacturing (321219); wood container and pallet manufacturing (32192); prefabricated wood building manufacturing (321992); all other miscellaneous wood product manufacturing (321999) |
| Paper and allied products | Pulp mills (32211); paper mills (32212); paperboard mills (32213); paperboard container manufacturing (32221); coated and laminated paper, packaging paper manufacturing (322222, 322221); all other paper bag and coated and treated paper manufacturing (322223, 322226, 322224, 322225); stationary product manufacturing (32223); sanitary paper product manufacturing (322291); all other converted paper product manufacturing (322299) |
| Wood furniture | Wood windows and door and millwork manufacturing (32191), wood kitchen cabinet and counter top manufacturing (33711); upholstered household furniture manufacturing (337121); non-upholstered wood household furniture manufacturing (337122); institutional furniture manufacturing (337127); wood TV , radio and sewing machine housing (337129); wood office furniture manufacturing (337211); custom architectural woodwork and millwork (337212, 337214); showcase, partitions, shelving and lockers (337215) |

^a Numbers in parentheses are North American Industry Classification System (NAICS) codes.

reports both Type I and SAM multipliers. For this study, only SAM multipliers are reported because they capture direct, indirect, and induced effects. SAM multipliers are calculated by dividing total effects by direct effects. To illustrate the current situation of the FPI, economic impacts were measured in nominal values and the changes were computed comparing the study results to Tilley and Munn (2007) in nominal dollars. Tilley and Munn (2007) used 509 industrial sectors but the 2009 IMPLAN data is based on 440 sectors. Because IMPLAN sectoring is linked to Bureau of Economic Analysis (BEA) Benchmark I-O data, IMPLAN's sectors are modified when BEA Benchmark data are modified. To adjust this dissimilarity in the data set, the bridge table provided by MIG (www.implan.com) was used to relate the 509 sectors model to the new 440 sectors model.

Results

The FPI produced 1.6 percent of the total industry output economy of the South in 2009 (Table 2). The industry generated 0.8 percent of the region's employment, 1.0 percent of wages and salaries, and 1.0 percent of value added. Average annual wages for employees in the industry were \$55,600 compared with \$47,300 for the South as a whole.

By most indicators, the paper and allied products was the largest sector within the region's FPI, accounting for 46.7 percent (\$12.2 billion) of the industry's wages and salaries, 60.3 percent of the industry's total output (\$80.0 billion), and 53.7 percent (\$23.1 billion) of the value added. For all of these indicators, lumber and wood products was the second largest sector and wood furniture was the third largest. For employment, however, the relative rankings by sector differed. The wood furniture sector accounted for 35.1 percent (164,972) of FPI employment, lumber and wood products accounted for 33.9 percent (159,690), and the paper and allied products sector accounted for the remaining 31.0 percent (145,788) (Table 2).

The economic contributions of the FPI as a whole varied substantially among the 13 states in the region (Table 2). For example, the value of total industry output for the FPI in North Carolina was \$16.2 billion compared with only \$2.3 billion in Oklahoma. By all economic indicators, North Carolina, Texas, and Georgia were the top three states in the region, accounting for over 36 percent of the regional industry's total economic activity. In contrast, Oklahoma,

Kentucky, and Louisiana were the smallest contributors to the region, together accounting for about 11 percent of the industry's total.

Similarly, the economic contributions of the individual forest products sectors varied among the 13 states but not necessarily in the same pattern as the industry as a whole. The lumber and wood products sector most closely mirrored the industry's distribution across the region. Georgia (\$3.2 billion), Texas (\$3.1 billion), and North Carolina (\$2.9 billion) were again the top three states and accounted for 33.7 percent of the region's total industry output (\$27.5 billion). Tennessee (\$1.6 billion), Kentucky (\$1.3 billion), and Oklahoma (\$432 million), the three states that generated the least, accounted for 12.1 percent of the sector's total. The distribution of the pulp and paper sector was similar to the industry's distribution in that three states accounted for 35.2 percent of the sector's output (\$79.9 billion); however, Tennessee (\$8.5 billion) joined Georgia (\$10.9 billion) and Texas (\$8.7 billion) in the top three. The bottom three, Mississippi (\$2.4 billion), Kentucky (\$4.1 billion), and Oklahoma (\$1.5 billion), accounted for only 10 percent suggesting a somewhat more skewed distribution. The distribution of the wood furniture sector among the states was substantially different from the industry as a whole and the other sectors. North Carolina (\$5.5 billion), Texas (\$4 billion), and Mississippi (\$2.7 billion) accounted for 48.5 percent of the region's total sector output (\$25.2 billion), illustrating the far more concentrated nature of this sector. South Carolina (\$541 million), Oklahoma (\$289 million), and Louisiana (\$250 million) accounted for only 4.3 percent.

The variability of FPI economic contributions across states and sectors can also be observed by examining SAM multipliers for lumber and wood products (Table 3), wood furniture (Table 4), and paper and allied products (Table 5). Regional multipliers (i.e., South) for each FPI sector were slightly higher than average state multipliers. The regional employment multiplier for the paper and allied sector was 4.0985, substantially higher than that for lumber and wood products (2.5548) and wood furniture (2.0863). The wage and salaries regional multipliers for paper and allied products, lumber and wood products, and wood furniture were 2.6631, 2.4120, and 2.1095, respectively. The total industry output regional multipliers for paper and allied products, lumber and wood products, and wood furniture were 1.7939, 2.0726, and 1.9170, respectively. The value-added regional multipliers for paper and allied products,

Table 2.—Economic contributions of the forest products industry in the South with monetary figures reported in nominal values for each year.

| State | FPI sector ^a | Employment | | Wages and salaries (\$MM) | | Total industry output (\$MM) | | Total value-added (\$MM) | |
|-------|-------------------------|------------|-------------------|---------------------------|-----------|------------------------------|-----------|--------------------------|-----------|
| | | 2009 | 2001 ^b | 2009 | 2001 | 2009 | 2001 | 2009 | 2001 |
| AL | L&WP | 15,347 | 25,467 | 715.7 | 854.9 | 2,673.8 | 3,883.2 | 965.0 | 1,305.1 |
| | WF | 11,183 | 14,530 | 454.8 | 417.5 | 1,630.0 | 1,300.3 | 596.2 | 562.1 |
| | P&AP | 12,447 | 16,356 | 1,254.7 | 1,116.2 | 8,417.1 | 6,098.4 | 2,550.0 | 2,109.8 |
| | Total | 38,977 | 56,353 | 2,425.2 | 2,388.6 | 12,720.9 | 11,281.9 | 4,111.3 | 3,977.0 |
| | State total | 2,483,858 | 2,421,223 | 108,135.9 | 78,499.5 | 335,134.8 | 225,575.4 | 168,773.2 | 119,442.1 |
| | % of region | 8.3 | 7.9 | 9.3 | 8.7 | 9.6 | 9.8 | 9.5 | 10.0 |
| AR | L&WP | 12,912 | 20,362 | 544.0 | 611.4 | 2,234.6 | 2,882.1 | 757.8 | 899.3 |
| | WF | 6,673 | 9,926 | 283.8 | 275.3 | 1,085.9 | 927.7 | 408.5 | 381.9 |
| | P&AP | 10,352 | 13,479 | 761.1 | 1,522.7 | 5,827.0 | 3,660.1 | 1,568.7 | 1,212.9 |
| | Total | 29,937 | 43,767 | 1,588.9 | 2,409.4 | 9,147.5 | 7,469.9 | 2,735.0 | 2,494.1 |
| | State total | 1,536,622 | 1,517,570 | 63,562.6 | 43,792.9 | 203,954.9 | 136,607.1 | 98,124.8 | 66,854.6 |
| | % of region | 6.4 | 6.1 | 6.1 | 8.8 | 6.9 | 6.5 | 6.4 | 6.3 |
| FL | L&WP | 10,778 | 17,077 | 419.7 | 548.5 | 1,628.0 | 2,134.5 | 583.9 | 775.4 |
| | WF | 11,787 | 19,008 | 512.5 | 556.5 | 1,771.7 | 1,685.7 | 680.7 | 744.9 |
| | P&AP | 9,282 | 11,614 | 768.2 | 634.5 | 5,142.3 | 3,091.9 | 1,526.0 | 945.3 |
| | Total | 31,847 | 47,699 | 1,700.5 | 1,739.5 | 8,541.9 | 6,912.1 | 2,790.6 | 2,465.6 |
| | State total | 9,725,755 | 9,172,732 | 437,720.2 | 315,613.9 | 1,180,813.0 | 810,441.3 | 712,243.3 | 491,198.8 |
| | % of region | 6.8 | 6.7 | 6.5 | 6.3 | 6.4 | 6.0 | 6.5 | 6.2 |
| GA | L&WP | 18,614 | 26,761 | 844.4 | 933.3 | 3,234.5 | 3,865.9 | 1,186.7 | 1,370.8 |
| | WF | 12,159 | 16,144 | 523.7 | 478.1 | 1,917.2 | 1,557.1 | 743.7 | 639.9 |
| | P&AP | 18,956 | 27,910 | 1,614.0 | 1,624.6 | 10,947.3 | 7,960.2 | 3,166.0 | 2,676.9 |
| | Total | 49,729 | 70,815 | 2,982.1 | 3,036.0 | 16,098.9 | 13,383.2 | 5,096.4 | 4,687.6 |
| | State total | 5,238,732 | 4,964,658 | 253,277.4 | 194,681.8 | 724,192.9 | 525,771.1 | 412,686.9 | 307,932.2 |
| | % of region | 10.6 | 9.9 | 11.4 | 11.1 | 12.1 | 11.6 | 11.8 | 11.8 |
| KY | L&WP | 8,059 | 16,047 | 304.6 | 407.0 | 1,313.4 | 1,892.2 | 455.2 | 531.0 |
| | WF | 7,808 | 8,415 | 310.7 | 265.3 | 1,191.2 | 790.0 | 430.8 | 362.6 |
| | P&AP | 9,146 | 10,616 | 638.4 | 526.7 | 4,119.3 | 2,515.1 | 1,102.8 | 804.0 |
| | Total | 25,012 | 35,078 | 1,253.7 | 1,199.0 | 6,623.9 | 5,197.3 | 1,988.9 | 1,697.6 |
| | State total | 2,320,324 | 2,327,652 | 99,822.9 | 74,231.6 | 316,540.4 | 227,294.8 | 159,083.9 | 113,884.7 |
| | % of region | 5.3 | 4.9 | 4.8 | 4.4 | 5.0 | 4.5 | 4.6 | 4.3 |
| LA | L&WP | 9,930 | 13,544 | 513.2 | 473.6 | 1,791.4 | 2,066.7 | 739.1 | 719.2 |
| | WF | 1,790 | 1,732 | 67.5 | 37.3 | 249.6 | 127.1 | 88.4 | 49.7 |
| | P&AP | 7,059 | 10,542 | 667.6 | 629.0 | 4,252.5 | 3,413.8 | 1,274.7 | 1,117.1 |
| | Total | 18,778 | 25,818 | 1,248.3 | 1,139.9 | 6,293.5 | 5,607.6 | 2,102.2 | 1,886.0 |
| | State total | 2,492,614 | 2,502,534 | 115,645.6 | 80,588.3 | 426,401.1 | 245,162.2 | 188,445.9 | 122,582.8 |
| | % of region | 4.0 | 3.6 | 4.8 | 4.1 | 4.7 | 4.9 | 4.9 | 4.8 |
| MS | L&WP | 13,850 | 21,748 | 617.3 | 684.7 | 2,442.9 | 3,285.6 | 909.2 | 1,073.1 |
| | WF | 18,060 | 27,121 | 705.0 | 796.0 | 2,711.3 | 2,487.1 | 1,041.7 | 875.5 |
| | P&AP | 4,252 | 7,762 | 360.5 | 453.6 | 2,380.8 | 2,401.9 | 702.9 | 764.6 |
| | Total | 36,161 | 56,631 | 1,682.8 | 1,934.3 | 7,534.9 | 8,174.6 | 2,653.8 | 2,713.2 |
| | State total | 1,484,021 | 1,481,891 | 58,619.6 | 42,089.9 | 190,371.0 | 124,669.6 | 91,220.4 | 63,204.2 |
| | % of region | 7.7 | 8.0 | 6.4 | 7.0 | 5.7 | 7.1 | 6.2 | 6.8 |
| NC | L&WP | 17,349 | 29,921 | 746.1 | 944.2 | 2,944.6 | 4,236.2 | 1,119.8 | 1,365.1 |
| | WF | 35,458 | 71,997 | 1,458.3 | 2,034.7 | 5,465.6 | 6,571.7 | 2,190.5 | 2,494.5 |
| | P&AP | 16,417 | 21,148 | 1,220.8 | 1,066.4 | 7,787.4 | 5,781.8 | 2,045.4 | 1,684.1 |
| | Total | 69,224 | 123,066 | 3,425.1 | 4,045.3 | 16,197.5 | 16,589.7 | 5,355.7 | 5,543.7 |
| | State total | 5,178,695 | 4,924,710 | 236,488.2 | 170,379.6 | 688,173.5 | 480,296.9 | 376,667.6 | 260,284.5 |
| | % of region | 14.7 | 17.3 | 13.1 | 14.7 | 12.2 | 14.4 | 12.4 | 14.0 |
| OK | L&WP | 2,449 | 4,265 | 115.2 | 134.4 | 432.2 | 589.2 | 164.2 | 185.0 |
| | WF | 2,054 | 3,753 | 80.3 | 96.5 | 289.4 | 324.8 | 99.9 | 129.9 |
| | P&AP | 2,667 | 2,930 | 202.3 | 136.1 | 1,588.1 | 746.0 | 409.7 | 229.6 |
| | Total | 7,170 | 10,948 | 397.8 | 367.0 | 2,309.7 | 1,660.0 | 673.9 | 544.5 |
| | State total | 2,117,525 | 2,064,469 | 92,442.3 | 63,086.8 | 292,464.5 | 190,277.3 | 156,450.7 | 97,844.0 |
| | % of region | 1.5 | 1.5 | 1.5 | 1.3 | 1.7 | 1.4 | 1.6 | 1.4 |
| SC | L&WP | 10,429 | 13,121 | 491.6 | 462.1 | 1,915.0 | 1,997.7 | 759.1 | 671.4 |
| | WF | 3,806 | 6,129 | 150.9 | 174.8 | 541.5 | 562.9 | 189.3 | 229.9 |
| | P&AP | 12,724 | 14,736 | 1,091.6 | 879.1 | 7,302.7 | 4,245.0 | 2,158.9 | 1,441.8 |
| | Total | 26,959 | 33,986 | 1,734.1 | 1,516.0 | 9,759.2 | 6,805.6 | 3,107.4 | 2,343.1 |
| | State total | 2,421,264 | 2,280,026 | 100,262.0 | 73,015.3 | 298,493.1 | 206,423.4 | 159,593.2 | 111,346.6 |
| | % of region | 5.7 | 4.8 | 6.6 | 5.5 | 7.4 | 5.9 | 7.2 | 5.9 |

Table 2.—Continued.

| State | FPI sector ^a | Employment | | Wages and salaries (\$MM) | | Total industry output (\$MM) | | Total value-added (\$MM) | |
|-------|-------------------------|------------|-------------------|---------------------------|-------------|------------------------------|-------------|--------------------------|-------------|
| | | 2009 | 2001 ^b | 2009 | 2001 | 2009 | 2001 | 2009 | 2001 |
| TN | L&WP | 9,589 | 17,172 | 411.3 | 497.2 | 1,582.4 | 2,108.8 | 562.7 | 640.2 |
| | WF | 13,250 | 23,762 | 521.3 | 690.3 | 1,990.1 | 2,325.6 | 728.3 | 910.5 |
| | P&AP | 15,743 | 20,573 | 1,382.9 | 1,146.4 | 8,549.2 | 5,930.2 | 2,605.9 | 1,930.0 |
| | Total | 38,582 | 61,507 | 2,315.5 | 2,333.9 | 12,121.7 | 10,364.6 | 3,896.9 | 3,480.7 |
| | State total | 3,525,365 | 3,472,042 | 158,481.8 | 117,512.4 | 485,454.6 | 341,800.9 | 253,022.7 | 183,692.3 |
| | % of region | 8.2 | 8.6 | 8.9 | 8.5 | 9.1 | 9.0 | 9.1 | 8.8 |
| TX | L&WP | 17,758 | 28,435 | 817.0 | 955.5 | 3,104.2 | 3,179.4 | 1,277.1 | 1,327.7 |
| | WF | 26,031 | 32,058 | 1,122.9 | 949.6 | 4,030.9 | 2,955.7 | 1,535.6 | 1,277.3 |
| | P&AP | 17,635 | 26,004 | 1,473.6 | 1,327.9 | 8,652.0 | 6,239.1 | 2,627.9 | 2,044.4 |
| | Total | 61,424 | 86,497 | 3,413.4 | 3,233.0 | 15,787.1 | 12,374.2 | 5,440.6 | 4,649.4 |
| | State total | 13,880,603 | 12,638,113 | 713,492.6 | 504,759.2 | 2,358,272.3 | 1,421,497.7 | 1,224,308.2 | 790,807.3 |
| | % of region | 13.1 | 12.1 | 13.1 | 11.8 | 11.9 | 10.7 | 12.6 | 11.7 |
| VA | L&WP | 12,627 | 20,696 | 555.1 | 646.0 | 2,216.0 | 2,980.0 | 804.1 | 928.5 |
| | WF | 14,914 | 25,914 | 652.9 | 731.5 | 2,254.7 | 2,478.8 | 901.2 | 991.4 |
| | P&AP | 9,109 | 13,367 | 762.5 | 753.2 | 5,025.6 | 3,980.7 | 1,396.8 | 1,261.1 |
| | Total | 36,649 | 59,977 | 1,970.5 | 2,130.7 | 9,496.3 | 9,439.5 | 3,102.1 | 3,181.0 |
| | State total | 4,738,106 | 4,523,325 | 267,684.4 | 183,930.6 | 656,126.0 | 441,841.0 | 407,306.4 | 269,407.9 |
| | % of region | 7.8 | 8.4 | 7.5 | 7.8 | 7.2 | 8.2 | 7.2 | 8.0 |
| South | L&WP | 159,690 | 254,616 | 7,095.3 | 8,152.8 | 27,512.8 | 35,101.5 | 10,284.1 | 11,791.8 |
| | WF | 164,972 | 260,489 | 6,844.6 | 7,503.4 | 25,129.2 | 24,094.5 | 9,634.8 | 9,650.1 |
| | P&AP | 145,788 | 197,037 | 12,198.1 | 11,816.4 | 79,991.1 | 56,064.2 | 23,135.9 | 18,221.6 |
| | Total | 470,449 | 712,142 | 26,138.0 | 27,472.6 | 132,633.2 | 115,260.2 | 43,054.8 | 39,663.5 |
| | South total | 57,143,482 | 54,290,945 | 2,705,635.5 | 1,942,181.8 | 8,156,392.1 | 5,377,658.7 | 4,407,927.2 | 2,998,482.0 |

^a L&WP = lumber and wood products; WF = wood furniture; P&AP = paper and allied products.

^b All 2001 values are from Tilley and Munn 2007.

lumber and wood products, and wood furniture were 2.4961, 2.5141, and 2.3407, respectively.

There was considerable variation in multipliers among states and between indicators. For example, state employment multipliers for the lumber and wood products sector averaged 2.53 and ranged from Virginia's 2.2194 to Florida's 3.1281. State total industry output multipliers for this sector averaged 2.0515 and ranged from Kentucky's 1.8295 to Florida's 2.5587. For the wood furniture sector, state employment multipliers averaged 2.0570 and ranged from Oklahoma's 1.8836 to Florida's 2.4836. State total industry output multipliers for this sector averaged 1.8834 and ranged from Mississippi's 1.5634 to Florida's 2.2532. Pulp and paper

sector employment multipliers averaged 4.0262 and ranged from Kentucky's 2.9339 to Florida's 5.0702. State total industry output multipliers for this sector averaged 1.7607 and ranged from Mississippi's 1.5614 to Texas' 2.0261. Similar variation among states and between indicators was evident for wages and salaries and value added.

Although comparisons across sectors and among states are very informative, the relative contribution of the FPI to each state's economy is also very important as it is the relative size of an industry that determines, in large part, its influence with policymakers. We report the share of the state economy that the FPI represents by sector and state (Table 6) as measured by employment. South-wide, the industry

Table 3.—Social accounting matrix multipliers for the lumber and wood products sector in the South by state.

| State | Employment | | Wages and salaries | | Personal income | | Total industry output | | Total value added | |
|----------------|------------|-------------------|--------------------|--------|-----------------|--------|-----------------------|--------|-------------------|--------|
| | 2009 | 2001 ^a | 2009 | 2001 | 2009 | 2001 | 2009 | 2001 | 2009 | 2001 |
| Alabama | 2.5043 | 2.2138 | 2.2852 | 2.1106 | 2.2540 | 2.1513 | 1.9781 | 1.8437 | 2.4511 | 2.1873 |
| Arkansas | 2.4784 | 2.2204 | 2.3101 | 2.1427 | 2.1576 | 2.1256 | 1.9459 | 1.8548 | 2.4114 | 2.2401 |
| Florida | 3.1281 | 1.9852 | 3.0253 | 2.0170 | 2.9442 | 1.9908 | 2.5587 | 1.7685 | 3.2973 | 2.1581 |
| Georgia | 2.6796 | 2.1630 | 2.6114 | 2.2080 | 2.4764 | 2.1639 | 2.2210 | 1.9131 | 2.8130 | 2.3463 |
| Kentucky | 2.2596 | 1.9924 | 2.0871 | 2.1153 | 1.9401 | 2.1007 | 1.8295 | 1.8214 | 2.1249 | 2.3314 |
| Louisiana | 2.5567 | 2.2000 | 2.2246 | 2.0481 | 2.1640 | 2.0501 | 2.0341 | 1.8109 | 2.3052 | 2.1191 |
| Mississippi | 2.4923 | 2.1752 | 2.2469 | 2.0748 | 2.0925 | 2.0735 | 1.9374 | 1.8044 | 2.2663 | 2.1125 |
| North Carolina | 2.4781 | 2.1574 | 2.3719 | 2.1671 | 2.2575 | 2.1424 | 2.0189 | 1.8595 | 2.4049 | 2.2986 |
| Oklahoma | 2.2946 | 2.1849 | 1.9947 | 2.0584 | 1.8481 | 2.0341 | 1.8452 | 1.8084 | 2.1430 | 2.2416 |
| South Carolina | 2.6108 | 2.1131 | 2.2519 | 2.0471 | 2.1579 | 2.0256 | 1.9389 | 1.7769 | 2.2466 | 2.0995 |
| Tennessee | 2.5364 | 2.0765 | 2.6059 | 2.1962 | 2.7573 | 2.2133 | 2.1670 | 1.8980 | 2.8248 | 2.4740 |
| Texas | 2.6797 | 1.9743 | 2.6180 | 2.0471 | 2.4471 | 2.0148 | 2.2993 | 1.8290 | 2.6873 | 2.2284 |
| Virginia | 2.2194 | 1.9960 | 2.2594 | 2.0746 | 2.1873 | 2.0688 | 1.8948 | 1.7601 | 2.3494 | 2.2079 |
| State mean | 2.5322 | 2.1117 | 2.3764 | 2.1005 | 2.2834 | 2.0888 | 2.0515 | 1.8268 | 2.4865 | 2.2342 |
| Region | 2.5548 | NA | 2.412 | NA | 2.3091 | NA | 2.0726 | NA | 2.5141 | NA |

^a All 2001 values are from Tilley and Munn 2007. NA = not applicable.

Table 4.—Social accounting matrix multipliers for the wood furniture sector in the South by state.

| State | Employment | | Wages and salaries | | Personal income | | Total industry output | | Total value added | |
|----------------|------------|-------------------|--------------------|--------|-----------------|--------|-----------------------|--------|-------------------|--------|
| | 2009 | 2001 ^a | 2009 | 2001 | 2009 | 2001 | 2009 | 2001 | 2009 | 2001 |
| Alabama | 2.0485 | 1.6778 | 1.9939 | 1.7109 | 1.8979 | 1.6611 | 1.8524 | 1.7495 | 2.2736 | 1.8688 |
| Arkansas | 1.9455 | 1.7380 | 1.8744 | 1.7444 | 1.7887 | 1.6635 | 1.7031 | 1.7459 | 2.0051 | 1.8725 |
| Florida | 2.4836 | 1.6999 | 2.4721 | 1.8221 | 2.3699 | 1.7658 | 2.2532 | 1.7744 | 2.9022 | 2.0004 |
| Georgia | 2.2651 | 1.7699 | 2.3085 | 1.9763 | 2.1653 | 1.9032 | 2.0615 | 1.8916 | 2.5762 | 2.1857 |
| Kentucky | 1.9594 | 1.6962 | 1.9144 | 1.6522 | 1.8464 | 1.6758 | 1.7494 | 1.7095 | 2.0912 | 1.7686 |
| Louisiana | 1.9396 | 1.5513 | 2.0230 | 1.7714 | 1.9320 | 1.7311 | 1.8262 | 1.7192 | 2.2959 | 1.9450 |
| Mississippi | 1.7350 | 1.7399 | 1.6892 | 1.7197 | 1.6124 | 1.6473 | 1.5634 | 1.7832 | 1.7897 | 2.0653 |
| North Carolina | 2.0476 | 1.7624 | 2.0494 | 1.8789 | 1.9812 | 1.8130 | 1.8499 | 1.8580 | 2.1798 | 2.1627 |
| Oklahoma | 1.8836 | 1.7145 | 1.8819 | 1.7902 | 1.7790 | 1.6941 | 1.7445 | 1.7553 | 2.2198 | 1.9644 |
| South Carolina | 2.1032 | 1.6759 | 2.0397 | 1.7243 | 1.9383 | 1.6632 | 1.8936 | 1.7387 | 2.4230 | 1.9125 |
| Tennessee | 2.0684 | 1.8318 | 2.1757 | 1.9529 | 2.0332 | 1.8507 | 1.9048 | 1.8720 | 2.3993 | 2.1693 |
| Texas | 2.3345 | 1.6809 | 2.4173 | 1.8515 | 2.2648 | 1.7434 | 2.2233 | 1.8212 | 2.8004 | 2.0451 |
| Virginia | 1.9276 | 1.6790 | 2.0020 | 1.8279 | 1.9212 | 1.7645 | 1.8592 | 1.7495 | 2.2386 | 1.9907 |
| State mean | 2.0570 | 1.7090 | 2.0647 | 1.8017 | 1.9639 | 1.7367 | 1.8834 | 1.7822 | 2.3227 | 1.9962 |
| Region | 2.0863 | NA | 2.1095 | NA | 2.0066 | NA | 1.9170 | NA | 2.3407 | NA |

^a All 2001 values are from Tilley and Munn 2007. NA = not applicable.

Table 5.—Social accounting matrix multipliers for the paper and allied products sector in the South by state.

| State | Employment | | Wages and salaries | | Personal income | | Total industry output | | Total value added | |
|----------------|------------|-------------------|--------------------|--------|-----------------|--------|-----------------------|--------|-------------------|--------|
| | 2009 | 2001 ^a | 2009 | 2001 | 2009 | 2001 | 2009 | 2001 | 2009 | 2001 |
| Alabama | 4.8988 | 2.8676 | 2.6089 | 1.8607 | 2.5635 | 1.7781 | 1.7586 | 1.5160 | 2.3211 | 1.7655 |
| Arkansas | 3.5409 | 2.4840 | 2.4651 | 1.8200 | 2.2786 | 1.7180 | 1.6092 | 1.5311 | 2.1845 | 1.7938 |
| Florida | 5.0702 | 2.6469 | 3.2193 | 2.0834 | 3.2064 | 2.0029 | 2.0080 | 1.6323 | 2.9165 | 2.1809 |
| Georgia | 4.6027 | 2.6149 | 3.0010 | 2.0749 | 2.8376 | 1.9680 | 1.9044 | 1.6501 | 2.7585 | 2.0877 |
| Kentucky | 2.9339 | 2.2301 | 2.1489 | 1.7844 | 2.0382 | 1.7124 | 1.5694 | 1.5288 | 2.1156 | 1.8425 |
| Louisiana | 4.1540 | 2.7529 | 2.4782 | 1.9231 | 2.3175 | 1.8172 | 1.7596 | 1.5479 | 2.2910 | 1.8582 |
| Mississippi | 3.4942 | 2.5496 | 2.1528 | 1.7856 | 2.1047 | 1.6938 | 1.5614 | 1.5031 | 1.9946 | 1.7738 |
| North Carolina | 3.6345 | 2.5154 | 2.5418 | 2.0246 | 2.4623 | 1.9496 | 1.7367 | 1.5842 | 2.5569 | 2.0699 |
| Oklahoma | 3.8831 | 2.5540 | 2.6395 | 2.0173 | 2.4067 | 1.8425 | 1.6830 | 1.5983 | 2.4345 | 2.0130 |
| South Carolina | 4.0216 | 2.4188 | 2.4025 | 1.7460 | 2.2774 | 1.6754 | 1.6583 | 1.4983 | 2.2243 | 1.7698 |
| Tennessee | 4.2910 | 2.6572 | 2.7340 | 2.0312 | 2.4804 | 1.8880 | 1.8531 | 1.6047 | 2.5245 | 2.0137 |
| Texas | 4.0876 | 2.3580 | 2.8231 | 2.0570 | 2.8806 | 1.9007 | 2.0261 | 1.6885 | 2.8239 | 2.1580 |
| Virginia | 3.7278 | 2.4903 | 2.6635 | 1.9704 | 2.5757 | 1.9372 | 1.7613 | 1.5515 | 2.5536 | 1.9535 |
| State mean | 4.0262 | 2.5492 | 2.6060 | 1.9368 | 2.4946 | 1.8372 | 1.7607 | 1.5719 | 2.4384 | 1.9446 |
| Region | 4.0985 | NA | 2.6631 | NA | 2.5491 | NA | 1.7939 | NA | 2.4961 | NA |

^a All 2001 values are from Tilley and Munn 2007. NA = not applicable.

Table 6.—Forest products industry (FPI) employment by state and region for each FPI sector expressed as a percentage of total state employment.

| State | Total state | | Lumber and wood products (%) | | Wood furniture (%) | | Paper and allied products (%) | | Total FPI (%) | |
|----------------|-------------|-------------------|------------------------------|------|--------------------|------|-------------------------------|------|---------------|------|
| | 2009 | 2001 ^a | 2009 | 2001 | 2009 | 2001 | 2009 | 2001 | 2009 | 2001 |
| Alabama | 2,483,858 | 2,421,223 | 0.62 | 1.05 | 0.45 | 0.60 | 0.50 | 0.68 | 1.58 | 2.33 |
| Arkansas | 1,536,622 | 1,517,570 | 0.84 | 1.34 | 0.43 | 0.65 | 0.67 | 0.89 | 1.99 | 2.88 |
| Florida | 9,725,755 | 9,172,732 | 0.11 | 0.19 | 0.12 | 0.21 | 0.10 | 0.13 | 0.35 | 0.52 |
| Georgia | 5,238,732 | 4,964,658 | 0.36 | 0.54 | 0.23 | 0.33 | 0.36 | 0.56 | 0.97 | 1.43 |
| Kentucky | 2,320,324 | 2,327,652 | 0.35 | 0.69 | 0.34 | 0.36 | 0.39 | 0.46 | 1.08 | 1.51 |
| Louisiana | 2,492,614 | 2,502,534 | 0.40 | 0.54 | 0.07 | 0.07 | 0.28 | 0.42 | 0.77 | 1.03 |
| Mississippi | 1,484,021 | 1,481,891 | 0.93 | 1.47 | 1.22 | 1.83 | 0.29 | 0.52 | 2.46 | 3.82 |
| North Carolina | 5,178,695 | 4,924,710 | 0.34 | 0.61 | 0.68 | 1.46 | 0.32 | 0.43 | 1.35 | 2.50 |
| Oklahoma | 2,117,525 | 2,064,469 | 0.12 | 0.21 | 0.10 | 0.18 | 0.13 | 0.14 | 0.36 | 0.53 |
| South Carolina | 2,421,264 | 2,280,026 | 0.43 | 0.58 | 0.16 | 0.27 | 0.53 | 0.65 | 1.13 | 1.49 |
| Tennessee | 3,525,365 | 3,472,042 | 0.27 | 0.49 | 0.38 | 0.68 | 0.45 | 0.59 | 1.10 | 1.77 |
| Texas | 13,880,603 | 12,638,113 | 0.13 | 0.22 | 0.19 | 0.25 | 0.13 | 0.21 | 0.45 | 0.68 |
| Virginia | 4,738,106 | 4,523,325 | 0.27 | 0.46 | 0.31 | 0.57 | 0.19 | 0.30 | 0.78 | 1.33 |
| South | 57,143,482 | 54,290,945 | 0.28 | 0.47 | 0.29 | 0.48 | 0.26 | 0.36 | 0.84 | 1.31 |

^a All 2001 values are from Tilley and Munn 2007.

accounts for 0.82 percent of the regional employment. The industry accounted for over 1.5 percent of employment in Mississippi (2.44%), Arkansas (1.95%), and Alabama (1.57%). At the other extreme, the FPI accounted for less than 0.50 percent of state employment in Texas (0.44%), Oklahoma (0.34%), and Florida (0.33%). The lumber and wood products sector accounted for more than 0.5 percent of employment in Mississippi (0.93%), Arkansas (0.84%), and Alabama (0.62%). The wood furniture sector accounted for over 0.5 percent of state employment in only two states: Mississippi (1.22%) and North Carolina (0.68%). The paper and allied products sector employment exceeded 0.5 percent of the state employment in Arkansas (0.67%) and South Carolina (0.53%).

Discussion

As outlined previously, the two important objectives of this study were to determine the economic impacts and the associated SAM multipliers of the three primary FPIs in 13 southern states and in the region for the year 2009. Results suggest that the economic impacts of the FPI are substantial and associated SAM multipliers are considerable.

The economic contribution of the FPI in the South decreased from 2001 to 2009. The FPI generated 0.8 percent of employment, 1.0 percent of wages and salaries, 1.6 percent of total industry output, and 1.0 percent of value added in 2009 in the South, compared with 1.3, 1.4, 2.1, and 1.3 percent, respectively, in 2001 (Tilley and Munn 2007). In absolute terms, employment in the FPI decreased by 33.9 percent. However, total industry output and value added for the FPI increased by 15.1 and 8.6 percent, respectively, in nominal terms. In contrast, total industry output and value added for the entire US South economy increased by 51.7 and 47.0 percent, respectively, clearly indicating that the FPI did not keep pace with the economy as a whole over this time period. These results indicate the FPI as a whole sought increased efficiency by adopting new technologies, allowing for an increase in the substitution of capital for labor. In further evidence of this, consider employee compensation from 2001 to 2009 for the FPI compared with the US South economy. Wages and salaries paid by the FPI decreased by 4.9 percent compared with a 39.3 percent increase for the US South economy, but average annual wages for employees increased by 44.0 percent compared with 32.4 percent increase for the South as a whole. The FPI average annual wage was 17.3 percent higher than the South-wide average in 2009. This finding demonstrates capital substitution for labor within the FPI, and the labor retained is much more skilled as evidenced by the decrease in wages and increase in average annual wages paid compared with the overall US South economy.

There was some evidence of redistribution of the FPI within the region over this period from 2001 to 2009. Alabama, Louisiana, Mississippi, North Carolina, and Virginia lost market share as measured by the percentage of the region's total industry output, while Arkansas, Florida, Georgia, Kentucky, Oklahoma, South Carolina, Tennessee, and Texas gained market share. For the most part, these gains and losses were relatively small and did not affect the relative rankings of the states. The two major exceptions were Mississippi, which fell from seventh to tenth, and South Carolina, which rose from tenth to sixth. These changes in market share and rank reflect almost exclusively contraction in the lumber and wood products

sector and the relative proportion of the FPI that this sector makes in these states. Clearly the decline in housing starts that preceded the recession impacted state FPIs that were more heavily developed in lumber manufacturing.

Total industry output for the lumber and wood products sector decreased for all states in the region, although the decline in Texas was slight. This enabled Texas to move up from the fourth largest producing state in the region to second. Georgia moved from third largest to first while Alabama fell from first to fourth. These changes reflect the degree to which a states' lumber and wood products market share was dependent upon domestic consumption in the US residential housing construction market.

The distribution of wood furniture production within the region remained relatively stable. The major exceptions were North Carolina, whose total industry output for the sector decreased by over a \$1.1 billion, and Texas, whose output increased by roughly the same amount. North Carolina, however, still remained the largest wood furniture producer in the region. Clearly the decline in residential construction and impacts of the recession on the wood furniture industry had been as apparent by 2009 as was observed with the lumber and wood products sector. This may indicate the presence of a time lag between the reduction in home construction and wood furniture that is not as quick as the reduction in lumber production following a sharp decline in residential construction.

The distribution of paper and allied products production experienced no major shifts within the region. The value of total industry output for the sector increased in all states except Mississippi, which remained essentially flat. Alabama dropped from third to fourth while Tennessee went from third to fourth. At the lower end of the production distribution, Florida went from tenth place to eighth and Virginia fell from seventh to ninth.

The relative importance of the FPI to each state's economy, as measured by the share of total state employment, decreased in all states in the region and for the region as a whole from 2001 to 2009. This reflects possible capital substitution for labor and that the FPI did not grow as quickly as the US South economy from 2001 to 2009. This illustrates that the recession had a disproportionate impact on the FPI. Although the direct impacts of the industry decreased as a share of the total economy of the South, some of this decrease was offset by increases in the multipliers. Compared with 2001, the average state multipliers for all sectors of FPI were higher in 2009. This indicates that while the absolute size of the industry from 2001 to 2009 decreased, the relative importance of the industry as generator of economic activity actually increased as more FPI inputs to production were purchased locally.

Conclusions

The economic contribution of the FPI in the US South changes over time; however, no previous study has compared these changes or examined the contribution over more than one time period. It was anticipated that the recession of the early 2000's would have a disproportionate impact on the FPI compared with the overall regional economy. Although the recession did severely impact the FPI in the region, it is still an important contributor to the regional economy, particularly in the more rural states like Mississippi and Arkansas. The analysis indicates that capital

substitution for labor occurred between 2001 and 2009. Also, the contraction in FPI output over this time period demonstrates the disproportionate impact the recession had on the FPI, particularly on the lumber and wood products component of the industry. Study and documentation of the impact of the FPI on regional economies over time provides important information to policymakers and industry leaders necessary to promote and help advance the FPI. Such information can help provide justification to policymakers for beneficial tax treatment that can help support the FPI and is useful to FPI leaders and advocates when lobbying for government support. Thus, tracking economic trends of the FPI is very crucial. Changes in both direct effects and multipliers impact the magnitude of the contributions of the FPI to state and regional economies. Tracking both is critical to understanding how the industry is evolving over time. With appropriate support (beneficial tax policies, road and bridge weight allowances/restrictions, etc.), the industry will remain an important contributor for decades to come.

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