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Regional Economic Contributions of Forest-based Industry in the South: 2001-2009

Ram P. Dahal¹, Ian A. Munn² and James E. Henderson³
Email: rdahal@cfr.msstate.edu

¹Graduate Research Assistant, Department of Forestry, College of Forest Resource, Mississippi State University

²Professor, Department of Forestry, College of Forest Resource, Mississippi State University

³Assistant Extension Professor, Department of Forestry, College of Forest Resource, Mississippi State University

Abstract

The current recession and the associated sharp decline in housing and other constructional activities have had a large impact on the forest products industry. Documentation of the economic impacts over time identifies important industry trends, updates baseline economic information, and helps policy makers formulate appropriate legislation and regulations to support the industry. The South is one of the leading timber producing regions in the world. Thus, monitoring economic contribution of the forest-based industry in the South over time is crucial. This study reports the regional economic contribution of the industry in the South in 2009 dollars and compares that with the last comprehensive study of the industry in real terms. Impact Analysis for Planning (IMPLAN), an input-output modeling system, was used to model the economic impact of the industry and to estimate the changes over time. Twenty-six IMPLAN sectors were aggregated into three broad forest-based sectors (lumber and wood products, wood furniture, and paper and allied products sectors), and employment, earnings, value of shipments, and value-added for each sector were estimated. Results revealed that the forest-based industry is still an important source of employment and income in the South despite the downturn in the economy and its disproportionate effect on the forest products industry. From 2001 to 2009, the industry's employment decreased by 33.4% and earnings decreased by 18.6% in real terms; however, value of shipments and value-added increased by 59.20% and 68.23% respectively.

Introduction

Total economic value of the global forest-based industry was US \$468 billion, employing 13.7 million people in 2006 (Forest products industry technological road map 2010). The U.S. accounted for 23.2% of the global forest products industry economy (FAO 2011). Eighty-nine percent of timber harvested in 2009 was industrial round wood that was used for lumber, paper, other industrial products and export (USDA 2012). The South's forests cover 46% of the total land area of the South, the largest percentage of US forest land (Alvarez 2007). The region is the leading producer of timber in the world (Prestmon and Abt 2002). The forest products industry accounted for 1.6% of total economy of the South in 2009 (Dahal et al. 2013). The South's forests provide a range of services and benefits such as recreation and ecosystem services, employments, and revenues. Thus, forest resources are major economic assets for the South.

The housing collapse in 2006 and recession from 2007 to 2009 have had a great impact on the southern forest products industry economy (Woodall et al. 2011). In the ten year period of 1999 to 2009, the South lost 1,022 mills (Brandeis et al. 2012) causing the loss of thousands of jobs. Thus, the economic contribution of the forest products industry clearly changes over time. Changes in the forest products sectors bring larger changes on state, regional, and national economies. Over the past decade, the South's forest related industries went through significant contraction. Thus, monitoring economic contribution over time is crucial.

Studies of the impacts of forest-based industries are useful for policy makers to address critical economic issues and to strengthen the economic health of these sectors. This study replicates Tilley and Munn (2007), which is based on 2001 data, and determines the economic contribution of forest-based industries using 2009 data and then compares in real terms. Results from this study provide a detailed picture of how economic changes have impacted the South's economy and how the forest products industry's contribution has changed over time. In addition, this study also documents important trends in the industry. Consequences of the housing collapse and recession effects are estimated in terms of employment, earnings, value of shipments, and manufacturing value-added.

Methodology

Economic contributions of forest-based industries for 2009 were computed using Impact Analysis for Planning (IMPLAN) version 3.0 software. With the advent of IMPLAN, an input-output modeling system that is updated annually, it has been much easier to model the economic impact of industries and to estimate the changes over time. IMPLAN was originally developed by USDA Forest Service and today consists of 440 industrial sectors. Twenty-six closely related forestry IMPLAN sectors were aggregated into four major forest-based industry sectors. These include a forestry sector (forestry, forest products, and timber tract production), lumber and wood products sector, paper and allied products sector, and wood furniture sector. IMPLAN models were then constructed for thirteen southern states and for each forest-based industry sector. The thirteen southern states were also combined to generate regional economic impact in terms of forest-based employment and earnings.

Value of shipments and manufacturing value-added for 2009 were obtained from 2009 Annual Survey of Manufacturers (American Fact Finder). Gross state products values

for 2009 were obtained from U.S. Department of Commerce Bureau of Economic Analysis. North American Industrial Classification System (NAICS) codes 321 (wood product manufacturing) and 322 (paper manufacturing) were aggregated as forest-based industries.

To adjust for inflation, 2009 dollar values were deflated back to 2001 dollars using 2009 IMPLAN database deflators. Results were then compared to Tilley and Munn (2007) in real as well as in nominal terms.

Results

Forest-based industries accounted for 0.84% of the South's total employment in 2009, down from 1.3% in 2001. In spite of a 5.25% increase in total state employment, forest-based employment decreased by 33.35%. Between 2001 and 2009, forest-based jobs decreased for all sectors except for the forestry sector (which increased by about 2,100 jobs). Lumber and wood products sector, wood furniture sector, and paper and allied products sector lost 37.28%, 36.67%, and 26.01% of jobs respectively from 2001 to 2009 (Table 1.). Forest-based earnings accounted for 0.98% of total state earnings in 2009. Average annual forest-based earning was about \$55,000, about \$8,000 greater than that of total state average earnings. Without taking the forestry sector into account, forest based earnings decreased by 4.86% in spite of a 39.31% increase in regional total industry earnings in nominal terms. Paper and allied products sector earnings increased by 3.23% in nominal dollars, but in real dollars earnings decreased for all forest-based sectors. Between 2001 and 2009, total industry earnings for the region increased by 7.98% while forest-based earnings decreased by 18.63%. Lumber and wood products, wood furniture, and paper and allied products sectors' earnings decreased by 21.87%, 26.67%, and 11.29% respectively from 2001 to 2009 (Table 1.).

Table 1. Forest-based industry (FBI) employment and earnings of the South

Forest-based industry	Employment		Earnings (\$MM)		
			Nominal terms (current)		Real terms
	2001 ^a	2009	2001 ^a	2009	In 2001 dollar
Forestry	6,034	8,192	NA	419.7	349.3
Lumber and wood products	254,61	159,68	8,152.8	7,095.2	6,369.6
Wood furniture	260,48	164,97	7,503.4	6,844.6	5,502.0
Paper and allied products	197,03	145,78	11,816.4	12,198.1	10,482.1
Total FBI	718,17	478,64	27,472.6	26,557.7	22,703.1
South total	54,290,94	57,143,48	1,942,181.8	2,705,636.5	2,097,201.7

^a Tilley and Munn 2007

Forest-based value of shipments and manufacturing value-added (NAICS 321 and 322) accounted for 11.60% and 12.99% to total state value of shipments and total manufacturing value-added respectively in 2009 (Table 2.). In nominal dollars, between 2001 and 2009, forest-based value of shipments increased by 91.80% while it increased by 21.96% for all industry. However in real dollars, total industry value of shipments decreased by 5.91%, but for forest-based industry value of shipments increased by 59.20%. Forest-

based industry manufacturing value-added increased by 102.68% in comparison to an increase in total industry manufacturing value-added of 13.73% in nominal dollars. In real terms, the regional manufacturing value-added decreased by 13.73%, and forest-based manufacturing value-added increased by 68.23%. Forest-based industry manufacturing value-added as a percentage of gross state product increased from 1.41% to 1.96% in nominal dollars and 2.11% in real dollars from 2001 to 2009 (Table2.).

Table 2. Value of shipments, manufacturing value-added, and gross state product of the South

Year	Value of shipments			Manufacturing value-added			GSP (\$Bn.)	Value-added as % of
	All	FBI	%	All	FBI	%		
2001	1,329.3	98.02	7.37	578.84	42.20	7.29	2,991.93	1.41
2009	1,621.2	188.01	11.60	658.29	85.52	12.99	4,356.26	1.96
In 2001	1,250.7	156.05	12.48	507.87	70.98	13.98	3,360.83	2.11

^a Tilley and Munn 2007

Discussion and Conclusions

The major objective of this study was to estimate the change in economic contribution of the forest-based industry between 2001 and 2009 in nominal as well as in real terms. Estimated results revealed two major findings. First, there was an abrupt decline in forest-based employment and earnings and second, forest-based value of shipments and manufacturing value-added increased sharply. This suggests that forest-based industries are becoming less labor dependent and that profit margins are shrinking, possibly due to increased foreign competition and the economic downturn.

Among forest-based industry sectors, the paper and allied products sector made the largest contribution to the regional economy. Sectors closely related to housing were highly negatively impacted. Although total state employment and earnings for the southern region increased, forest-based employment and earnings decreased substantially. This decrease is consistent with a longer term trend, for example, employment decreased from 770,000 direct jobs in 1997 (Abt et al. 2002) to 718,000 in 2001 (Tilley and Munn 2007) and then to 573,000 in 2004 (Brandeis et al. 2012), however, it was much greater in the recent downturn (Hodges et al. 2007). This suggests that the recent recession and associated sharp decline in housing and other constructional activities had a disproportionately large negative impact on forest-based industries. Thus, recovery of housing and other constructional activities is critical to reviving the southern forest economy.

Social Accounting Matrix (SAM) multipliers for forest-based industry sectors were higher in 2009 in comparison with 2001 (Dahal et al. 2013) and average annual earnings was \$12,000 higher than total state average earnings. Thus, although the forest-based industry may

be shrinking in the South, forest-based industry is still one of the major contributors to the South's economy. In addition, forest-based industries have higher impacts in terms of employment than hunting, fishing, and wildlife-associated recreational activities. For example, Poudel et al. (2013) reported employment SAM multiplier for hunting recreational activities of 1.94 and Dahal et al. (2013) reported lumber and wood products, wood furniture, and paper and allied products sector's employment SAM multiplier of 2.53, 2.05, and 4.02 respectively. This indicates forest-based industries generate more additional jobs than forestry related recreational activities.

The findings of this study reveal that the forest-based industry is one of the major contributors to the South's economy; however, the size of that contribution has decreased in recent years. This study provides an update to baseline economic information on the forest-based industry, which can be helpful in guiding government policies designed to help restore forest-based industry's economic contribution.

Future research

This study should be periodically updated to identify and detail changes to the impact of forest-based industry. Future research should also concentrate on the causes of change in the industry so that appropriate actions can target the root causes of any negative changes. In addition, focus should also be made on non-market contributions like environmental services and recreational activities. New opportunities like wood-based bioenergy from unused mill residue might be helpful in increasing economic activity. Therefore, future research should also address emerging opportunities in relation to southern forest-based industries so that optimum use of forest resources can be made which can reinvigorate forest-based industry's economic impact in the South.

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