The Arkansas Forest Products Industry, 1985-2001

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University of Arkansas-Monticello
Monticello, Arkansas
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Impact Statement

Aply nicknamed the “Natural State,” Arkansas contains substantial forest resources, which are important components of the state’s economy. Forests provide wood that is used for an assortment of consumer products such as lumber, paper, furniture, particle boards, and plywood. They provide shelter and food for wildlife, scenic beauty, and an array of environmental benefits. This study focuses on the manufacturing-based forest products industries between 1985 and 2001 and analyzes a number of economic indicators associated with them. It also focuses on the primary forest products industries, i.e. lumber and paper, where most of the readily available and reliable data exist. Where data permit, some analyses of secondary industries are also included. Current information on different segments of the economy is crucial for researchers, industry personnel, and policy makers. This study provides a snapshot of the forest products industries during this time period and updates past research on the topic. The information provided herein should be useful for a variety of stakeholders.
The Arkansas Forest Products Industry, 1985-2001

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Introduction

The forest products sector is one of the largest manufacturing sectors in Arkansas. In 1999, forest products industries (lumber and wood products and paper and allied products; Standard Industrial Classification (SIC) codes 24 and 26, respectively) produced a total of $7.4 billion in industry outputs, second to the food manufacturing industries. These industries also employed approximately 41,000 employees, generating about $2.3 billion in value added. For decades forest products industries have made important contributions to the Arkansas economy and have been widely accepted as a crucial part of the Natural State’s well-being. Not surprisingly, this importance has sometimes given rise to concerns regarding the long-term sustainability of the forest products industries. For this reason, it is important to monitor changes in this sector and to provide up-to-date information; such information will be useful to entrepreneurs, policy makers, researchers, and landowners.

There have been some studies that focus on the importance of forestry in the Arkansas economy. Examples include Bentley et al., Troutman et al., and Van...
Hees. However, these studies either focus on a specific area of the forest industry, or are fairly dated. The present study is designed to provide a snapshot of the Arkansas forest products industries. Kluender et al. (1988) published a similar study that examines these industries for a period of 18 years (1964-1985). We deliberately follow a similar approach and provide an update on key economic indicators pertaining to the forest products industries. Additionally, we provide some information not included in the Kluender et al. study.

Objectives
To develop a clear picture of Arkansas’ forest products sector, this study gathered data from various public databases in order to accomplish the following objectives:
1. To compile and present up-to-date information on prices and productivity in the forest products industries in Arkansas.
2. To investigate changes in the nature of the forest products market.
3. To investigate employee earnings in the forest products industries.
4. To investigate recent issues in the forestry sector and the future outlook for forestry and the forest products industries in Arkansas.

Methodology
This study required the collection of data on production, prices, employment, and earnings. Forest production data were collected from the Arkansas Forestry Commission’s severance tax records. Price data were collected from the publications of Timber Mart-South. Employment and earnings data were collected from the Arkansas Employment Securities Division. In addition, forest inventory data were collected from the U.S. Forest Service, and data on gross state products were collected from the U.S. Department of Commerce. These collected data were then processed to achieve the necessary conversions to comparable units and magnitude. The data were then plotted to generate charts. It is important to note here that at least part of this report focuses only on primary forest products industries (lumber and paper industries). This was a deliberate decision, due to the unavailability of reliable data. While we do provide and discuss data on employment and earnings in the furniture industry, we refrain from discussing capacity in other secondary forest products industries.
Status of the Arkansas Forest Products Industry

Production

Total production from forests: Kluender et al. (1988) found that Arkansas forest production tended to generally follow U.S. production between 1964 and 1982. In our study, however, we find Arkansas production trends to be quite different from the national trend (Figure 1). Arkansas production saw a small increase between 1985 and 1986 by approximately a 100,000 MCF (thousand cubic feet) and remained more or less at the same level until about 1999 when the downturn of the economy eventually caused production to decrease. We do not have enough data beyond 1999 to statistically verify this downward trend; however anecdotal information seems to confirm its continuation. Strong demand for housing has continued, despite a weak general economy since 1999, contributing to the general stability in the Arkansas forest products industries. The total U.S. production, on the other hand, has seen its ups and downs since 1985. From about 17,000 MMCF (million cubic feet) in 1985, U.S. forest production reached its summit in 1988 at approximately 19,000 MMCF. After 1998, however, U.S. production showed an overall downward trend with a significant dip in 1991 (below 18,000 MMCF), some limited recovery, and then another low point in 1997 (approximately 17,250 MMCF). Loss of production in the U.S. West since the late 1980’s was probably a contributing factor to this. Following 1997, U.S. production showed a general upward trend and by 2000 was at

Figure 1. Total forest production: Arkansas and the U.S.
around 17,750 MMCF. Increase in production in the southern U.S., as new plantations established in the early 70’s reached harvest age, has been an important component of this growth.

Figure 2 represents the percentage of total U.S. forest production from Arkansas. The Natural State’s share of total national production remained between 3 and 4 percent between 1985 and 2000. This is somewhat lower than the findings by Kluender et al (1988). While it is entirely possible that Arkansas’ share of U.S. production has gone down, we also suspect that the source of the data may bear some of the responsibility. U.S. production data for this study were collected from the U.S. Forest Service,10 as with Kluender et al. However, these two sets of data were collected from two different Forest Service publications, which may have contained slightly different estimates.

In terms of annual percentage change based on volume, Arkansas production trends appear to be more volatile compared to U.S. forest production (Figure 3). While there were times when the percent annual change in Arkansas closely mimicked the national changes (1989-1995), in some instances Arkansas’ changes were much higher than those nationally (1986-1988), and times when they were not necessarily in the same direction (1995-1998).

A closer look at Figure 1 reveals an important shift in Arkansas’ production trends. Kluender et al. (1988) found that Arkansas production closely followed U.S. trends, although it generally lagged behind national production by about 6 to 12 months. Arkansas forest industries have traditionally been slow to respond
to national changes due to their labor-intensive nature. However, our study found Arkansas forest production to be somewhat independent of the national trend. Production in Arkansas remained flat from 1987 to about 1999. U.S. production, however, experienced two significant dips between 1988-91 and 1993-97. This phenomenon is more evident in Figure 2, which shows that Arkansas’ share of U.S. production has actually increased since 1994.

**Forest production by category:** Pine timber production remained strong between 1985 and 2000 in Arkansas, showing a steady increase from about 65% of total Arkansas production in 1985 to 70% in 2000 (Figure 4). Hardwood, the remainder of the total, displayed a slight decreasing trend over the same period.

![Figure 3. Annual percent change in Arkansas and U.S. forest production](image3)

![Figure 4. Arkansas timber production by species category](image4)
Figure 5. Total housing starts in the U.S., 1986-1999

Figure 6. The four physiographic regions in Arkansas
Again, the strength in pine timber production can be attributed to a strong housing market. Figure 5 represents total housing starts in the U.S. between 1986 and 1999. The housing market is strongly dependent on softwood timber, and a strong demand from the housing sector has contributed to the rise in the softwood share of Arkansas timber production.

We also analyzed forest production from different regions in Arkansas. The state was subdivided into four physiographic regions—Delta, Ozark, Ouachita, and Coastal Plain (Figure 6). Figure 7 shows the total wood production from each of these regions. The share of total state production from the Coastal Plain decreased slightly between 1991 and 1996, but remained stable for the rest of the time period. Production from the Ozarks and the Ouachita regions also remained stable throughout this period. Interestingly, the Delta region made up for the decrease in production from the Coastal Plain between 1991 and 1996. An explanation of this may be found in the first wave of timber supply from the Conservation Reserve Program (CRP) plantations in the Delta that hit the market around this time. This caused an oversupply of wood in the Delta resulting in a price reduction, which may have, in turn, caused the mills to procure more wood from the Delta region.

Investigating regional production by category reveals that the Coastal Plain, as expected, was the leading producer of pine timber in the state, accounting for about 70 percent of the state’s total pine production (Figure 8). The Ouachita region produced about 20 percent of pine timber over the study period. In 1985,
the Ozark region produced approximately 8 percent of pine, which decreased by about half in 1987. Pine production from the Ozarks picked up again in 1995 and was at about 7 percent of the state’s total production by 2000. The Delta region’s share of pine production was less than 2 percent in 1985, which increased slightly but steadily to about 3 percent in 2000.

In hardwood production, the Coastal Plain produced 64% of the hardwood in 1985, but this number decreased significantly between 1990 and 1998. Beginning in 1998, there was a slight increase in hardwood production, and by 2000 the Coastal Plain was at about 60% (Figure 9). Production from the Ouachita region remained largely stable, while the Ozark region experienced a
significant increase in hardwood production. Ozark’s share of hardwood production was 10% in 1985, which increased to 25% in 1998. It appears that most of the loss in hardwood production from the Coastal Plain was filled by the Ozark region. The Ozarks have vast amounts of traditionally underutilized hardwood resources. However, in recent years several forest products companies located in the southern part of the state have expanded procurement to buy lower quality hardwoods in the Ozarks, possibly contributing to increased production. Production in the Delta region remained largely stable, with a slight, gradual increase.

Figure 10. Forest production by species category from the Coastal Plain region

A closer look at each of the different regions reveals trends in hardwood and pine production for individual regions. In the Coastal Plain, 68 percent of timber produced in 1985 was pine, which gradually increased to 80 percent by 2000 (Figure 10). This therefore implies that, over this same period, hardwood production decreased from 32 percent to 20 percent. Figure 11 represents the same information for the Ouachita region. Pine production from this area experienced an initial increase between 1985 and 1991, then a drop between 1992 and 1997. It, however, increased after 1997 and was back at the 1991 level (82%) in 2000. Hardwood production from the Ozark region experienced an initial increase in 1987, remained largely stable since then and was at about 45 percent in 2000 (Figure 12). Although production from the Delta region was more volatile than any other, production of pine timber has in general shown an increasing trend (Figure 13). Pine production from the Delta was less than 20
percent in 1985, which increased to 30 percent in 2000. As mentioned earlier, the establishment of a substantial amount of CRP plantations likely caused this increase.

In summary, the Coastal Plain appears to have put a significant drain on its hardwood resources, causing the industry to move into the northern part of the state for hardwood pulpwood. Pine production grew in all regions as pine planting increased in the Ozarks and the Delta. Landowner assistance programs and an anticipated rise in future demand also appear to have contributed to this increase. Hardwood production, on the other hand, did not appear to get much attention. The focus has been largely on pine, even in the northern part of the state.

Figure 11. Forest production by species category from the Ouachita region

Figure 12. Forest production by species category from the Ozark region
Prices for Forest Products

Price information for Arkansas forest products (both stumpage and delivered) were obtained from Timber Mart-South, a subscription-based organization that publishes regional price information for forest products. It is important to note that Timber Mart-South’s price data consist essentially of average prices based on their survey of forest products transactions. While actual data taken from the field would perhaps be more accurate, such data are also difficult to obtain for a variety of reasons. We obtained average price information for the state between 1985 and 2001 from Timber Mart-South and in some cases compared them to the average Southeast prices. Stumpage and mill-delivered data on both pine and hardwood products (pulpwood and sawtimber) were analyzed.

Figure 13. Forest production by species category from the Delta region

Stumpage prices: Arkansas pine pulpwood stumpage prices trailed the Southeast average by about $1/ton until 1995 and then dropped off considerably (Figure 14). In fact, pine pulpwood stumpage prices in Arkansas showed a general downward trend between 1995 and 1999 while the Southeast average continued to increase. The difference in pulpwood stumpage prices between Arkansas and Southeast averages was as high as $5 in 1999 (about 45 percent of the Southeast average price). This was likely due to over production in Arkansas leading to an excess supply of pine pulpwood which drove prices down. Since 1999, however, the Southeast average has declined and was within $2 of the Arkansas average in 2001.

Hardwood pulpwood stumpage prices in Arkansas, on the other hand, almost exactly followed the Southeast average trends, except for a slight separation
around 1990 (Figure 14). Hardwood pulp is a much smaller market compared to pine in Arkansas; however, due to some increase in hardwood utilization capacity in the state, demand for hardwood pulpwood has been increasing. Perhaps for this reason, hardwood pulpwood prices showed a general increasing trend between 1995 and 1998 (from about $1/ton in 1985 to about $5/ton in 1998). After 1998, hardwood pulpwood prices dropped somewhat and were between $3.50 and $4/ton by 2000. Interestingly, average hardwood pulpwood prices increased slightly between 2000 and 2001 and were actually higher than average pine pulpwood prices in 2001.

In the case of sawtimber, average prices for both pine and oak sawtimber were quite volatile between 1985 and 2001, especially after 1991 (Figures 15a, 15b, and 15c). Since 1991, pine sawtimber prices have experienced a 135 percent increase within 3 years. This was due to the economic boom of the early 1990s and an exceptionally strong housing market. Oak sawtimber prices lagged behind pine by about a year and began to increase after 1992. Since the early 1990s, both pine and oak sawtimber prices have remained high, although both began to exhibit a decreasing trend in the late 90s. Average prices for hardwood sawtimber, which includes all hardwood, showed a more stable but generally increasing trend, and closely followed the Southeast average prices. While generally following trends similar to the Southeast average, Arkansas oak sawtimber prices remained higher than the Southeast average throughout the time period. This is indicative of an increase in demand and intense competition for oak sawtimber in Arkansas.

Figure 14. Standing pulpwood prices, 1985-2001
Figure 15a. Standing pine sawtimber prices, 1985-2001

Figure 15b. Standing oak sawtimber prices, 1985-2001

Figure 15c. Standing hardwood sawtimber prices, 1985-2001
Delivered prices: Delivered prices for pulpwood and sawtimber followed the same general pattern as pulpwood, although this appeared to be a little more stable. Arkansas and the Southeast average pine pulpwood prices were almost equal in 1985 at about $18.50/ton (Figures 16a and 16b). Arkansas’ delivered-pine-pulpwood prices followed the Southeast average closely until about 1992, but lagged behind after 1992 at about $19.50, approximately $1.50 below the Southeast average. Arkansas hardwood pulpwood prices, on the other hand, were very similar to the Southeast average except for slight deviations between 1993-94 and 1996-97. Arkansas and Southeast average delivered-hardwood-pulp-
wood prices were both at about $11.50 in 1985, which increased to about $23 in 1997. After 1997, both Arkansas and the Southeast average showed a slight decline and were at about $21 in 2001.

Delivered prices for sawtimber also followed the same general pattern as stumpage prices (Figures 17a, 17b, 17c). Pine sawtimber prices experienced a sustained increase in the early 1990s, from about $25.50/ton in 1991 to about $56.50/ton in 1998. After 1998, pine sawtimber prices dropped somewhat and were at about $48.50/ton in 2001. Oak sawtimber prices had some ups and
downs from year to year, but experienced a general increasing trend until the late 1990s. Similar to pine sawtimber, a slight drop occurred after 1996; however oak sawtimber prices began leveling off after 1998 and were at about the same level as pine sawtimber in 2001. Hardwood sawtimber prices showed lesser movements from year to year, with a general increasing trend, and moved from about $18/ton in 1985 to about $34/ton in 2001.

**Cut and haul rates:** Cut and haul rates are defined as the difference between mill-delivered price and stumpage price (Kluender et al. 1988). These prices reflect the cost of at-the-stump processing and transportation, assuming transportation to the mill is completed in a timely manner. Cut and haul rates for pine pulpwood ranged between $11 and $17.50/ton, while those for pine sawtimber varied between $7 and $18/ton (Figures 18a and 18b). Oak sawtimber and hardwood sawtimber cut and haul rates were similar to those of pine sawtimber, about 25 to 40% of delivered price on average. Cut and haul rates for pulpwood, on the other hand, were about 75% of the delivered price.

In general, cut and haul rates for hardwood pulpwood were higher than other products and remained high throughout the period ranging from about $10 to about $17/ton. This is probably due to the cost involved in transporting hardwood resources from the northern to the central and southern regions of the state. In addition, dealing with smaller trees requires increased handling costs.

Calculating cut and haul rates by simply subtracting the stumpage price from the mill-delivered price can be problematic for two principal reasons. First, pur-

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**Figure 17c. Delivered hardwood sawtimber prices, 1985-2001**

![Graph showing delivered hardwood sawtimber prices from 1985 to 2001.

- AR
- SE Avg

---

20
chase of stumpage and actual harvesting and transportation of the timber often occur at different times. Mills will purchase timber months ahead of time and negotiate a cut and haul contract when the timber is actually needed at the mill (Kluender et al. 1988). Second, and somewhat related to the first reason, inflation can have a substantial impact on these rates. To demonstrate the impact of inflation, Figure 19 shows pine sawtimber cut and haul rates in both nominal and real (constant 1985 dollars) terms. It is evident that when adjusted for inflation, cut and haul rates appear relatively more stable.

**Figure 18a.** Cut and haul rates for sawtimber, 1985-2001

![Graph showing cut and haul rates for sawtimber](image)

**Figure 18b.** Cut and haul rates for pulpwood, 1985-2001

![Graph showing cut and haul rates for pulpwood](image)
Employment in the Forest Products Industry

As mentioned earlier, the employment data analyzed in this section were collected from the Arkansas Employment Security Division of the Department of Labor. Forest products industries are usually categorized into numerous industry types based primarily on the output produced. Traditionally, this categorization was based on the U.S. Department of Commerce’s Standard Industrial Classification (SIC) system. In January 2001, however, industry classification was switched to the North American Industry Classification System (NAICS). For our purposes, we further aggregated the data into three forest-related industry groups—sawmill and logging, furniture, and pulp and paper. It is also important to note that these industry groups have certain distinguishing characteristics based on their use of inputs. Sawmills and pulp and paper mills fall into what is often called primary manufacturing mills. These mills are the first manufacturing destination once wood is procured from the forest. Primary manufacturing mills use roundwood to produce products that can either be sold in the market or to other mills that use them as inputs. Mills in the furniture category, on the other hand, are known as secondary processing mills; they use outputs from primary mills as inputs and produce finished products such as furniture, flooring, and containers.

Employment in the three forest products industry groups remained fairly stable between 1986 and 2000 (Figure 20). Total employment in all three of these groups experienced a slight increase in the early 1990s due to industry expansion.
resulting from a strong economy. Total forest products employment was at about 44.6 thousand in 1991, which increased to about 48.7 thousand by 1995, and has remained flat since then. A close examination of the individual industry groups reveals that most of this increase in total employment was due to increases in the sawmill and logging sectors. The pulp and paper industries also experienced a slight increase while employment in the furniture industries remained flat.
Examining employment in the three forest products industry groups as a percent of total forest products employment shows a near-constant trend between 1985 and 2001 (Figure 21). This means that each industry group’s share of total forest products employment did not experience any substantial change. Such a change is usually triggered by expansion or contraction within an industry due to economic factors, technological change, etc. Because employment numbers remained fairly flat over the time period, and there has not been a substantial technological change, this trend is not surprising. Employment in the logging and sawmill industry group was at about 47 percent of total forest products employment. The furniture group accounted for about 23 percent of total employment, which experienced a slight decrease in the 1990s; but it climbed back to the 1985 level by 2001. Pulp and paper, on the other hand, held steady at about 30 percent during the same period.

Earnings and Productivity

Earnings data were also collected from the Arkansas Employment Securities Division and the U.S. Department of Commerce. Total earnings in the Arkansas forest products industry experienced substantial growth between 1986 and 2000, increasing from $800 million in 1986 to about $1.5 billion in 2000 (Figure 22). Between 1986 and 1987 total earnings increased 8.5 percent. Since then, total earnings have maintained an average annual growth rate of about 4.5 percent. Annual change in total earnings was around 2 percent or less in 1989, between 1994-96, and 2000; though never in negative territory.
Total earnings in the pulp and paper industry group increased from $349 million in 1986 to $634 million in 2000 (Figure 22). The annual rate of change remained positive throughout the period, with an increase of almost 9 percent between 1986 and 1987, and 1990 and 1991. The smallest growth in total pulp and paper earnings was about 1 percent between 1988 and 1989. Since 1994, however, the annual increase in total earnings remained at approximately 2 percent, with a spike to about 6 percent in 1988-1999. The average annual change in pulp and paper total earnings was around 4.4 percent for the period of 1986-2000.

**Figure 23.** Percent annual change in total earnings in the Arkansas forest products industry by sector, 1986-2000

Total earnings in the logging and sawmill industry group were $312 million in 1986, which increased to $576 million by 2000 (Figure 22). Earnings increased by about 7 percent between 1986 and 1987, gradually decreasing to 2 percent by 1991. After 1991, total earnings in the industry group experienced significant increases and exceeded 8 percent in 1993 and 1994. Since then, however, growth in earnings slowed and was actually negative in 2000. An economy-wide slowdown is the likely reason for this. Because the logging and sawmilling industry group produces primary forest products to be used by other secondary processing industries, it is likely to be hit first from a slowdown in harvests due to weak demands. During 1986-2000, the logging industry group maintained an average annual rate of change in total earnings of 4.5 percent.

Total earnings in the furniture industry group increased from $142 million in 1986 to $269 million in 2000 (Figure 22). The annual percent change in total earnings was more volatile than in any other forest products industries. Furniture
earnings increased by about 8 percent almost every other year, while increasing by around 2 percent or less in the remaining years. The average annual change in earnings was about 4.7 percent.

Average weekly earnings in the forest products industries also exhibited similar patterns (Figure 24). Average weekly earnings in the pulp and paper industry were significantly higher than in any of the other forest products industries, even higher than average weekly earnings in the Arkansas manufacturing sector as a whole. This is not surprising, however, since pulp and paper employees have traditionally been those highest paid within the forest products industries. Weekly earnings in the pulp and paper industry were $545 in 1986 and gradually increased to $836 by 2000. Although the percent change in pulp and paper average weekly earnings (when compared to the immediately preceding year) had its ups and downs, it consistently remained in the positive territory ranging from 0.4 percent to more than 5 percent.

Average weekly earnings in the logging sector remained at about 9 percent below weekly earnings in all of manufacturing (Figure 24). Logging weekly earnings ranged from $312 in 1986 to $496 in 2000. Annual percent change in this sector also remained positive throughout the period and varied between 1 percent and 6 percent. Average annual growth in weekly earnings for the period was about 3.4 percent.

In the case of the furniture sector, average weekly earnings remained on average about 16.5 percent below weekly earnings in all of manufacturing (Figure 24).

Figure 24. Average weekly earnings of forest products workers by sector, 1986-2000
Weekly earnings in the furniture sector were about $290 million, which increased to $471 million by 2000. Although annual percent change in weekly earnings was negative in 1988, 1993, and 1995, overall they experienced an average annual growth rate of about 3.5 percent between 1986 and 2000.

A look at forest products earnings as a percent of total manufacturing earnings shows that total earnings in the forest products sector held steady at around 20 percent between 1986 and 2000 (Figure 25). This is a somewhat different finding than Kluender et al. (1988), who found a decreasing trend in forest products percentage of total manufacturing earnings between 1965 and 1983. Comparing these two time periods, it is evident that earnings in the forest products industry, when compared to all of manufacturing, have stabilized at about 20% of the total manufacturing sector. This emphasizes the continual importance of the forestry sector in Arkansas’ economy.

The forest product industry’s contribution to the gross state products is presented here as an indicator of industry productivity. Data for this section were collected from Mr. John Shelnutt of the University of Arkansas at Little Rock. Figure 26 presents the three industry groups’ contributions to Arkansas’ gross state product. It is important to note here that these contributions are presented in terms of millions of real 1992 dollars, meaning monetary values expressed here are in constant dollars with inflation being factored out. Looking strictly at value contribution to the gross state product, the forest products industry’s position appears stable with steady, albeit slow, growth. However, this tells us nothing about the contributions of other industries relative to that of forest products.
Figure 26. Forest products industry’s contribution (in millions of 1992 dollars) to the gross state products by sector, 1986-2000

Figure 27, on the other hand, shows the percent contribution of the forest products industry to the gross state product. This figure shows a steady decline in the industry’s contribution. Several factors are probably at work here. First, as the state’s economy diversified, its dependence on the forest products industry reduced. This hurt the relative position of the industry within the state’s economy. Second, expansion in the state’s forest products industry has been slow, per-

Figure 27. Percent contribution of Arkansas forest products industry to gross state products, 1986-2000
haps slower than the other major manufacturing industries. This, in turn, reduced the contribution of the forest products industry relative to others.

**Forest Products Mills in Arkansas, 2002**

Data for this section were collected from the Arkansas Forestry Commission. The Commission regularly compiles a list of mills in Arkansas; this mill directory—as of July 2002—was used. In 2002, Arkansas had a total of 522 forest products mills operating within the state. Among these mills, 332 (64%) were primary manufacturing mills.

Among the primary manufacturing mills, 275 (83%) were sawmills. Table 1 presents the distribution of primary manufacturing mill types in Arkansas. It is evident from the table that Arkansas has very diverse forest resources. Although the total number of sawmills seems rather large when compared to paper mills, many of these saw mills are small, sometimes seasonal operations. All 6 of the paper mills are in the southern part of the state and have fairly large outputs.

In terms of capacity, all the primary mills had an approximate combined capacity of 1.2 million MBF (thousand board feet) per year Doyle scale. Capacity for individual mills varied widely. This is expected since the mill directory contains all mills in Arkansas, including those owned by global corporations and small “mom and pop” operations. Table 2 provides a size distribution of primary manufacturing mills.

Data for mill closings in Arkansas were collected from U.S. Conservation—a pro-forest-products industry interest group. The group compiled mill closures between 1990 and 2003. However, this information should be used with caution. It is very likely that the group’s mill closure list contains information on closures of mills of a certain size, perhaps only mills owned by national and multinational corporations. Consequently, it is highly likely that many small operations are not included in this list. This may explain the relatively small number of closures listed (Table 3). Nevertheless, this list presents closures of some of the older, inefficient mills and consolidations among large forest products companies.
Table 1. Number of primary forest products mills by mill type, 2002.

<table>
<thead>
<tr>
<th>Mill type</th>
<th>Number of mills</th>
<th>Percent of total</th>
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</thead>
<tbody>
<tr>
<td>Sawmill</td>
<td>275</td>
<td>82.83</td>
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<tr>
<td>Chip mill</td>
<td>6</td>
<td>1.81</td>
</tr>
<tr>
<td>Handle</td>
<td>9</td>
<td>2.71</td>
</tr>
<tr>
<td>Charcoal</td>
<td>7</td>
<td>2.11</td>
</tr>
<tr>
<td>Post/pole</td>
<td>10</td>
<td>3.01</td>
</tr>
<tr>
<td>Pulp/paper</td>
<td>6</td>
<td>1.81</td>
</tr>
<tr>
<td>Plywood</td>
<td>7</td>
<td>2.11</td>
</tr>
<tr>
<td>Veneer</td>
<td>3</td>
<td>0.90</td>
</tr>
<tr>
<td>Board</td>
<td>1</td>
<td>0.30</td>
</tr>
<tr>
<td>Shaving</td>
<td>8</td>
<td>2.41</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>332</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Arkansas Forestry Commission

Table 2. Size class distribution of primary forest products mills, 2002.

<table>
<thead>
<tr>
<th>Size class (BF/year)</th>
<th>Number of mills</th>
<th>Capacity (MMBF)</th>
<th>Percent of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 million</td>
<td>209</td>
<td>209</td>
<td>62.95</td>
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<tr>
<td>1-3 million</td>
<td>45</td>
<td>90</td>
<td>13.55</td>
</tr>
<tr>
<td>3-5 million</td>
<td>19</td>
<td>60</td>
<td>5.72</td>
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<tr>
<td>5-10 million</td>
<td>17</td>
<td>127.5</td>
<td>5.12</td>
</tr>
<tr>
<td>10-15 million</td>
<td>4</td>
<td>50</td>
<td>1.2</td>
</tr>
<tr>
<td>15-20 million</td>
<td>4</td>
<td>70</td>
<td>1.2</td>
</tr>
<tr>
<td>More than 20 million</td>
<td>34</td>
<td>680</td>
<td>10.24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>332</strong></td>
<td><strong>1286.5</strong></td>
<td><strong>100</strong></td>
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</tbody>
</table>

Source: Arkansas Forestry Commission


<table>
<thead>
<tr>
<th>Mill type</th>
<th>Number of mills</th>
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</thead>
<tbody>
<tr>
<td>Pulp/paper</td>
<td>6</td>
</tr>
<tr>
<td>Sawmill</td>
<td>6</td>
</tr>
<tr>
<td>Box plant</td>
<td>1</td>
</tr>
<tr>
<td>Container</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

Source: U.S. Conservation
The Arkansas Forest Products Industry: Recent Changes and Future Outlooks

The forest products industry in Arkansas has experienced numerous changes since the mid-1980s. The very nature and management of our forest resources have changed significantly. Gone are the days of exclusively timber-based forest management. Forestry now encompasses a more holistic approach to resource management, focusing on other forest resources such as wildlife, recreation, water, and biodiversity. In its quest for achieving economic efficiency, the forest industry has also gone through extensive restructuring measures. In addition, there have been significant developments in policy. All of these factors have added several dimensions to forest management and to the operations of the forest products industry. This section discusses some of these factors.

Arkansas Forest Resources

Since the early- to mid-1980s, Arkansas’ forest area has grown considerably. This is part of a pattern throughout parts of the southern U.S. Since 1982, several states in the South such as Alabama, Arkansas, Kentucky, Mississippi, South Carolina, and Tennessee have experienced an increase in total forest area. Between 1982 and 1999, total forest area in Arkansas increased from 17.1 million acres to 18.8 million acres. Many of these additions were due to the conversion of idle croplands or pastures into forests. Forest lands classified as timberlands (i.e. land capable of producing at least 20 cubic feet of wood per year) also went up in Arkansas, from 16.7 million acres in 1982 to 18.4 million acres in 1999, mostly in softwoods. Much of this increase has been in the non-industrial private forest (NIPF) category. Arkansas has seen an explosion in planted pines, rising from about 435 thousand acres in 1982 to 1.8 million acres in 1999. This trend is significantly different than those described in Kluender et al. (1988). It appears that the trend of losses in forest-land base has reversed due to low profitability in agriculture, cattle farming, and the unwillingness of younger generations to take over family farms. In fact, the Southern Forest Resource Assessment (SFRA) has projected a continuation of this trend in the western part of the South, including Arkansas. In addition, loss of timberland in the eastern part of the South is pushing production to the West.

The SFRA also provides information on other characteristics of southern forests. An examination of the changes in different forest types reveals that Arkansas’ increase in forest area is by no means limited to loblolly-shortleaf type forests. Between 1982 and 1999, oakpine forests increased by about 5 percent,
while oak-hickory forests increased by about 9 percent. In terms of size classes, there has been a substantial increase, about 20 percent, in the hardwood sawtimber class. There was also an increase in softwood sawtimber acreage. In poles, softwood poletimber acreage increased by 41 percent, while hardwoods experienced a slight decrease. Starting with the Soil Bank program, and numerous other subsequent programs such as the Conservation Reserve Program, there was a substantial amount of softwood plantation in the South. These plantations are now maturing and probably account for the increase in softwood sawtimber and pole classes. It also appears that continued landowner assistance programs in recent years have also succeeded in increasing softwood acreage even further. Between 1982 and 1999, acreage in the softwood sapling-seedling size increased 23 percent; while hardwood experienced only a slight rise. Other than the aforementioned large increase in planted pines, increases in acreage were also experienced in oak-pine, upland hardwood, and lowland hardwood, while natural pine experienced a 16 percent decrease.

Between 1982 and 1999, softwood growing stock in Arkansas increased by 12 percent. Hardwood growing stock, on the other hand, grew by 35 percent within the same period. For years, Arkansas’ hardwood resources remained underutilized. Recently, however, hardwood resources have received some attention from the industry. There have been some new concentration yards in northern Arkansas, and mills in the southern part of the state that are seeking additional hardwood and pine are now looking northward. Kluender et al. (1988) raised biodiversity concerns due the increase in pine forests. In this respect, increases in mixed pine-hardwood and hardwood forests are certainly encouraging. However, most new pine forests are in fact plantations—implying that the biodiversity concerns still hold true.

**Mergers and Acquisitions**

Over the last two decades, the forest products industry in the U.S. has become increasingly global. This trend of globalization has caused a myriad of corporate restructurings. One such restructuring effort has been through mergers and acquisitions that characterized the industry during this period, especially since the 1990s. This appears to be part of the industry’s efforts to cut costs through vertical integration and specialization in product niches where there are few competitors, therefore gaining market power. While there are numerous examples of these mergers and acquisitions, the following are some selected examples: Kimberly Clark acquired Scott Paper in 1995; International Paper merged with Federal Paper Board Company in 1996 and acquired Union Camp
in 1999; the Weyerhaeuser Company acquired MacMillan Bloedel in 1999 and Willamette Industries in 2002; Georgia-Pacific Corporation spun off its timberland division as The Timber Company in 1997 and acquired Fort James in 2000; The Timber Company then merged with Plum Creek Timber Company in 2001; Westvaco’s merger with Mead in 2002 created the MeadWestvaco Corporation.

While mergers and acquisition can certainly strengthen a company’s position in the market by concentrating market share, vertical integration in production, and market power in products, there are some important issues for consumers and society in general. First, there are anti-trust issues involved in the process. Although every merger is required by law to be approved by the federal government, there are still concerns about these restructuring efforts. Second, there are price concerns. A vertically integrated corporation with substantial market share can afford to sell its products at prices that are not optimally determined by market forces. This can have important implications for consumers and landowners. Third, as companies merge or acquire other companies, a common next step is to “trim the fat,” that is, to cut costs. Lay-offs are often an integral part of such activities and can have an impact on the labor market.

Nonetheless, it appears that these mergers and acquisition efforts may have stabilized for the time being, although there are still mills within the state that are potential candidates for acquisitions. Most large corporations have restructured their operations and now appear to be focusing on improving efficiency.

**Sale of Timberlands**

Somewhat related to corporate restructuring, forest product industries have also been selling significant portions of their timberland holdings. Faced with economic downturn in the late 1990s, forest products corporations felt the need to cut operation costs. Many of these companies also had a significant debt burden and needed to inject some cash into their cash flow. As a result, a number of corporations sold noteworthy portions of their timberland holdings. As mentioned earlier, Georgia-Pacific Corporation spun off all of their timberland operations as a separate company that later merged with Plum Creek. Other companies that sold significant portions of their timberland holdings included Louisiana-Pacific, MeadWestvaco, Champion International, and International Paper. Some of these timberland sales were in Arkansas.

These timberland sales raise important questions about the future management of these forests. Regardless of ownership, there is no doubt that these lands are important in maintaining a healthy supply of forest products. After these
lands changed hands, their management as productive timberlands became dependent on the objectives of the new owners. So far, it appears that most of the buyers were either Timberland Investment Management Organizations (TIMOs) or NIPF landowners. It will be interesting to observe the future management of these lands in terms of both intensity and quality.

There are also questions regarding the soundness of decisions by these companies to sell timberland. While these sales may have provided some short-term relief by cutting costs and improving cash flow, it is not clear how this decision will play out in the long-term supply of inputs for these companies. Due to economic downturn, demands are currently low. However, demands are sure to increase once the economic outlook improves. Faced with increased demand these companies will need an increased supply of wood, a higher proportion of which will now have to be bought from other sources. Therefore, the decision to sell timberlands may end up increasing costs for the forest products industry in the long run.

Revision of Best Management Practices

Best Management Practices (BMPs) for protecting water quality originated from the requirements of the federal Clean Water Act (CWA). Because the Environmental Protection Agency (EPA) did not have the infrastructure and funding to enforce all the requirements of the CWA, some of these responsibilities were delegated to the states. One part of these responsibilities was the control of non-point source pollution from agriculture and forestry. BMPs evolved as a direct result of these new responsibilities. While some states such as Florida, Kentucky, North Carolina, and Virginia adopted BMPs as mandatory regulatory instruments, most of them, including Arkansas, took the voluntary route and adopted them as guidelines to be followed by timber producers.

BMPs in Arkansas were revised in 2002 after almost 30 years. The Arkansas Forestry Commission (AFC) felt that BMP guidelines needed to be revised with additional provisions for establishing Streamside Management Zones (SMZs), and they updated the guidelines based on more recent research from across the South.

Tax Issues

Forest properties are subject to a variety of different taxes. First, there are property taxes charged by the state. Income from forest properties, much like any other income, is subject to federal and state income taxes. Mills pay severance taxes to the state based on the tonnage of wood shipped to them. In addition,
there are federal estate taxes on the inheritance of forest properties, also known as the “death” tax.

A recent provision in Congress has instituted a gradual phasing out of estate taxes by the year 2010. Under this provision, the portion of estate worth more than $1 million is taxed at 49 percent in 2003. In 2004 and 2005, the portion worth $1.5 million will be taxed at 48 and 47 percent, respectively. In the subsequent years, the estate tax rate will decrease until 2010 when an estate will be taxed at the regular income tax rate. However, this provision is not permanent; it must be renewed to be effective beyond 2010. This phasing out of estate taxes is likely to have a significant impact on NIPF landowners and may help prevent forest fragmentation. It is also likely to boost investment in forest properties.

There have been some recent discussions in the state legislature regarding a possible increase in the severance tax rate. Due to economic downturn, state revenues are currently down and lawmakers are looking for possible alternate sources of revenue. However, such proposals have met with serious opposition from the forest products industry and have failed to generate adequate support in legislative committees. Current severance tax rates in the state are $0.178/ton for pine and $0.125/ton for hardwoods.

The Red Oak Borer

Red oak mortality in the Ozark region is a recent hot topic in the state. Although oak decline is a national phenomenon and certainly not new in the Ozarks, the level of damage caused by the red oak borer between 1999 and 2001 is unprecedented. There has not yet been any scientific estimate on the level of damage; however, the U.S. Forest Service estimates it to be severe (i.e. more than 50% of oak trees dead or dying) in 350,000 acres in the Ozark-St. Francis National Forest. Another 325,000 acres are estimated to have moderate levels of damage. These estimates are only on federal lands, as there are currently no estimates of the level of damage on NIPF forestlands in northern Arkansas. Hopefully, ongoing collaborative research between the Forest Service and the Arkansas Forest Resource Center (AFRC) will produce scientific estimates for both federal and private land in the near future.

A factor such as the red oak borer can have significant impact on forest management in the state. First, there are direct economic impacts to consider. There is likely to be a sudden glut of borer-damaged red oak timber in the market. Whether or not these damaged wood materials can be utilized is an open question, but there are obvious price impacts of this sudden over-supply. Second, the very future of red oaks as an economically important species is uncertain. In the
absence of adequate regeneration (which is unlikely in the Ozarks), red oaks could be severely affected in northern Arkansas. This would undoubtedly have long-term economic impact in the region. Third, there are questions on species composition in future forests in the Ozarks.

**Certification**

Forest sustainability certification is another fairly recent and controversial topic. Few issues have created more debate within the forestry community than certification. The basic premise of certification is about tracking wood products back to the stand and finding a way to certify whether the wood came from a forest that has been managed sustainably. The issue of certification initially surfaced due to its widespread support from environmental groups. This is also probably part of the reason for many foresters’ resentment of the issue. Regardless of the controversy, however, it appears that forest certification is here to stay.

There are several certification schemes currently available. The two most well-known are those sponsored by the Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI). Apart from these, NIPF ownerships can also become certified by the American Tree Farm System, which has a mutual recognition agreement with SFI. Although FSC and SFI certification criteria and procedures are widely different, the biggest distinction is perhaps in the certifying bodies themselves. FSC is backed by a coalition of environmental organizations known as the Rainforest Alliance. SFI, on the other hand, is backed by the American Forest & Paper Association (AF&PA). As one can imagine, SFI’s link to the industry has been a point of criticism from environmental interest groups. Right now, it appears that FSC and SFI are engaged in a race to enroll as much land as possible in their programs. As of June 15, 2003 FSC had a total of 21.3 million acres in North America, SFI, on the other hand, had enrolled 107.8 million acres in the U.S. Currently there is no indication of any discussions between these two organizations regarding mutual certification of each other’s members. Both FSC and SFI have their own product labels to identify these products made from certified wood at the retail level.

Much of the criticism of certification stems from the fact that it has failed to produce any tangible benefits for members. While following environmentally sound forestry practices is no doubt beneficial for society, there have not been any additional economic returns from certification. Consumers are yet to show a preference for any forest products carrying a certification label. However, the costs of going through the certification process are significant. While some value
can be gained from improved public relations due to certification, absence of an economic incentive is certainly discouraging.

Conclusions

Regardless of the current weak economy, the long-term outlook for the Arkansas forest products industry is quite positive. The economy is subject to business cycles that naturally move up and down through time. However, the Southern Forest Resource Assessment’s prediction of a net increase in total forest area in Arkansas sounds promising. Such an increase will probably translate into an expansion in the industry.

Arkansas timber prices have been volatile, but appear to be going strong compared to the average for the southeastern region. In fact, average prices in Arkansas have been stronger than those for the southeastern region for much of the period considered for this study. Production in the state has been more stable when compared to the rest of the nation. Arkansas’ share of total U.S. production has also experienced steady growth until recently.

Arkansas employment in forest products industries has been quite stable since 1985. Employment in all three industry groups—pulp and paper, furniture, and sawmill and logging—has also been stable. While there were some jobs lost due to mill closings, these jobs were mostly absorbed by other wood industries. Earnings and productivity in the forest products industry have grown at a steady pace since 1985.

The Arkansas forest products industry’s contribution to the gross state product, however, has been declining at a steady pace. This is probably due more to the lack of adequate expansion in the industry than to contraction. While other major manufacturing industries in Arkansas have grown, the forest products industry has remained stable, causing a decline in percent share of gross state products.

Demand for forest products has remained strong during 1985-2001. This is certainly good news for the industry. The weak economy has again weeded out older, less productive and less efficient wood products establishments. As the economy rebounds, the remaining establishments are well suited to expansion. Given strong demand for its products, the industry should be back at full swing once the economy turns around. However, it should be noted that the forest products industry has historically lagged behind the rest of the economy; therefore, recovery will be slow.
End Notes

6Levins, B. 2002. Personal communication.

Len Bollman, Oak Sustainability Coordinator, Ozark-St. Francis National Forest, Russellville, AR, personal communication.


