# HOW IMPORTANT ARE COTTON GINS TO RURAL ECONOMIES IN THE MID-SOUTH?

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## Abstract

This research measures the economic impact that cotton ginning has on the economies of Mid-South states. Results indicate that region-wide, cotton ginning generates almost $439 million in total economic impact with an economic output multiplier of 2.39. This sector is a major economic contributor to the overall economic impacts of the cotton supply chain of the cotton industry.

## Introduction

Cotton has traditionally been a foundational commodity for the Mid-South. For these states, it has historically been one of the top five market value agricultural commodities. Market conditions in the most recent two years (2007-08) caused a dramatic shift in cotton acreage that has impacted the region's production. A four-year profile of bales ginned is presented in Figure 1.

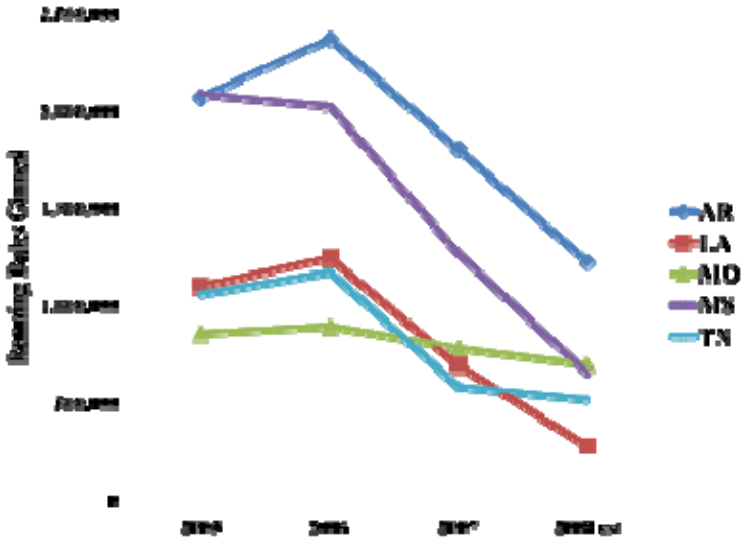


**Figure 1. Four-Year Cotton Production Profile for the Mid-South.**

In 2005, almost 7.2 million bales were ginned in Mid-South states. Both Arkansas and Mississippi produced more than two million bales in 2005, accounting for more than half of the total production of the five-state area. From 2005 to 2006, cotton production increased slightly in the five-state region. Dramatic declines in production occurred in the area between the 2006 and 2007 crop year. The smallest decline occurred in Missouri. Based on 2008 estimates, total bales ginned will have been reduced to less than 3.4 million bales, a 53percent reduction from 2005 levels.

Mississippi has seen the greatest magnitude of production losses, with a 1.4 million bale reduction from 2005-08. Alternatively, the largest percentage of decline occurred in Louisiana which exhibited a 75 percent reduction in production over this time period. Louisiana production was adversely impacted in 2008 by Hurricane Gustav, severely reducing yields in many areas of the state.

While cotton production in the five-state area has declined over the last several years, the number of active gins has also declined. Gin numbers have been declining over time in response to a number of factors. These factors include technology changes within the gin, as well as changes in harvest technology. The introduction and widespread adoption of the module builder fundamentally altered the effective ginning season for gins. Since the module builder provided a means of safely storing seed cotton, the harvesting and ginning operations were effectively decoupled. This made possible the extension of the ginning season well beyond the harvest period.

Within the gin, the addition of larger and more efficient gin stands effectively increased the capacity of gins. As gins were able to process more seed cotton, the competition for additional volume increased among gins. This competition, coupled with other factors, forced smaller and less efficient gins out of business. As shown in Figure 2, gin numbers have declined from just under 400 in the Mid-South in 1997 to just over 200 in 2007. This chart illustrates that the decline in gin number for the Mid-South has been slower than for the United States as a whole.

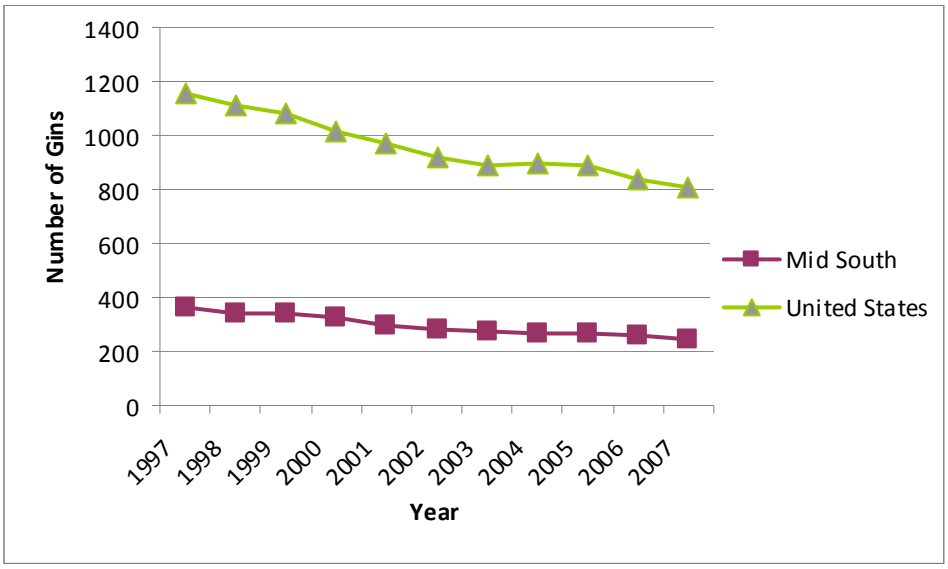


**Figure 2. Number of Gins in the Mid-South and United States, 1997-2007.**

Given the sharp decline in cotton production in the area, additional pressure is being placed on gins. Less cotton production means that the level of competition for cotton to gin has increased. The increased competition, in turn, means that some gins will not operate. Cotton gins are typically an important economic component to the local community. As gins cease operation, what impact will this action have on the local community and beyond?

## Materials and Methods

### Measuring a Cotton Gin's Economic Impact

Unlike other value-added agricultural processing activities, a cotton gin does not purchase a raw agricultural commodity and then procure a higher value-added product as its output. Rather, the cotton gin provides a service to the cotton producer without ever taking ownership of the agricultural commodity. Hence, the economic impact of cotton ginning is based on two key elements: (1) the costs of ginning (including material inputs and services, seasonal labor, and full-time labor costs), and (2) proprietor income earned from the ginning process.

Data necessary to estimate the economic impact of cotton gins was obtained from a survey of active cotton gins in the Mid-South area. The survey instrument was a modified version of the periodic ginning cost survey. Working with the Southern Cotton Ginner's Association (SCGA) and the Agricultural Research Service, the authors added additional questions to the SCGA tri-annual ginning cost survey. In addition to traditional detailed questions on material and labor input cost, questions concerning the location of spending (in-county, in-state, out-of-state), local vs. non-local ownership, and those concerning other related marketing activities were added.

These data were used to generate Mid-South wide and state-specific ginning revenue and cost averages. These data were applied to IMPLANTM input-output software (Minnesota IMPLAN Group 2004) to estimate indirect and multiplier effect spending. Mid-South and state-specific results are presented below.

## Results and Discussion

### Ginning Revenues and Costs

Data obtained in the survey of gins, as well as data from other sources, were used to calculate average costs and revenues for the sample gins. Table 1 presents the average per bale revenues and expenditures of ginning for sampled Mid-South gins. Estimates were based on the average sized Mid-South gin that ginned 24,353 bales in 2007.

As shown in Table 1, variable costs averaged about $25 per running bale and total costs were $39 per bale. These represent averages across all gins in the sample. Total variable costs of ginning ($24.87) represent approximately 64 percent of total ginning costs. The largest variable cost categories include seasonal labor and repair and maintenance. In the fixed cost category, full-time labor was the highest fixed cost representing 46 percent of fixed costs. Seasonal labor and full-time labor combined represent approximately 32 percent of total gin costs.

**Table 1. Mid-South Cotton Gin Revenue and Cost Estimates, 2007.**

| Category | Per Bale ($) | Category | Per Bale ($) |
|---|---|---|---|
| Electricity | 3.55 | Insurance | 2.42 |
| Dryer Fuel | 1.67 | Office | 0.35 |
| Bags/Ties | 4.13 | Capital Improvements | 4.87 |
| Repair and Maintenance | 4.42 | Full-Time Labor | 6.51 |
| Module Hauling | 4.32 | Total Fixed Costs | 14.15 |
| Tarp | 0.90 | Total Costs | 39.02 |
| Seasonal Labor | 5.88 | Revenue[2] | 69.49 |
| Total Variable Costs[1] | 24.87 | Net Revenue | 30.47 |

[1]Variable costs do not include seed rebates to producers.
[2]Revenue includes gin seed and mote sales but excludes warehouse rebate.

### Ginning Impacts to the Five-State Mid-South Region

Table 2 displays the economic impacts from cotton ginning spending on the five-state Mid-South region. These impacts are based on 3.38 million bales ginned in the Mid-South in 2007. Direct spending represents the proportion of total category spending that occurs locally within the five-state region. Total effects include the local direct, plus other local indirect and induced spending.

For non-labor inputs, the total spending impact exceeded $189 million. This included $112 million of local direct spending (from $137 million in total non-labor spending) on material and service inputs, plus an additional $76 million that was spent on other goods and services in the Mid-South. In addition, $96 million of value added and $57 million of labor income were created from ginners spending on non-labor inputs. Labor and proprietor income impacts ranged from $74 million in labor income effects to almost $250 million in output effects.

The local spending output multiplier for non-labor inputs was 1.69. This means for every one dollar spent on non-labor materials and services from Mid-South vendors, there is a total change in output of $1.69 across all sectors of the five-state Mid-South economy.

**Table 2. Total Cotton Ginning Impacts to the Mid-South Region, 2007.**

| Category | Direct ($) | Total ($) | Local Spending Multiplier |
|---|---|---|---|
| **Output** | | | |
| Non-Labor | 112,181,887 | 189,761,207 | 1.69 |
| Labor & Proprietor | 146,177,556 | 249,160,842 | 1.70 |
| | | | |
| **Value Added** | | | |
| Non-Labor | 55,759,657 | 95,854,499 | 1.72 |
| Labor & Proprietor | 77,442,607 | 131,469,308 | 1.70 |
| | | | |
| **Labor Income** | | | |
| Non-Labor | 33,407,834 | 57,399,293 | 1.72 |
| Labor & Proprietor | 42,682,902 | 73,795,907 | 1.73 |

Table 3 shows the output spending impacts and local spending multipliers for each of the five states in the Mid-South. Arkansas generated the highest total impact of all individual states with over $128 million, primarily from having the largest number of bales ginned among Mid-South states in 2007.

Missouri and Tennessee generated the highest local spending multipliers (1.65 and 1.61 respectively). These states have a greater number of diversified industries statewide, creating more opportunities for in-state purchases, and, thus, generating higher multipliers.

When comparing regional multipliers (Table2) with local spending multipliers for individual states (Table 3), note that individual multipliers are smaller than those for the Mid-South region as a whole. This occurs because spending outside one's home state reduces a state's multiplier, but if that same spending occurs in a neighboring Mid-South state, it is considered a linkage for the region and increases the region's multiplier.

**Table 3. State Cotton Ginning Output Effects and Local Multipliers, 2007.**

| State | Direct ($) | Total ($) | Local Spending Multiplier |
|---|---|---|---|
| Arkansas | 85,452,727 | 128,368,585 | 1.50 |
| Louisiana | 32,040,908 | 48,569,191 | 1.52 |
| Missouri | 36,317,367 | 59,753,794 | 1.65 |
| Mississippi | 56,412,007 | 81,788,078 | 1.45 |
| Tennessee | 28,154,422 | 45,220,831 | 1.61 |

**Total Multipliers and Interpretation**

The total output multiplier for Mid-South cotton ginning in 2007 was 2.39. This means for each additional dollar's worth of ginning services demanded, there is a total change in output across all sectors of the five-state Mid-South economy of $2.39.The first dollar of the $2.39 output multiplier goes to meet the initial demand for cotton ginning services. The remaining $1.39 is additional indirect spending across all economic sectors of the Mid-South.

The cotton ginning multiplier does not represent the entire multiplier for the cotton supply chain. Such a multiplier would include the original dollar's worth of demand for cotton plus summing up the additional spending effects from production, ginning, warehousing, and marketing activities.

## Summary

This study shows that cotton ginning has a measurable impact on the economy of Mid-South states. These impacts spread from local vendors within and between Mid-South states, as well as to local residents and gin ownership.

As Mid-South states and rural counties and parishes adjust to near-term lower cotton production levels, they should consider strategies to help maintain this infrastructure element in the cotton supply chain. Loss of this capacity would not only affect residents directly in the industry, but would also affect many others who do not even know their economic livelihoods are influenced by those working at the gin stand or on the bale.

## References

Minnesota IMPLAN Group (2004). IMPLAN Professional User Guide. 3rd Edition. Stillwater, MN. February.

National Agricultural Statistics Service (2008). Cotton Ginnings. Released December 22.