2005 Preliminary Indices

1995-2005P Logging Cost Index

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Preface

The fundamental objective of the Wood Supply Research Institute (WSRI) is to enhance pro-competitive awareness of factors that affect the efficiency, stability, and economic viability of the industrial wood supply system. Thus, the members of WSRI believe that the industry needs some continuous, long-term, credible, index of trends related to the cost of producing wood and the financial health of the system.

The long term cost and productivity study conducted by Mississippi State University originated within the Industrial Forestry Operations Research Coop at Virginia Tech in 1990. The study has been supported by the Forest and Wildlife Research Center at MSU since 1999. The objectives of this study have been to: monitor the effects of changes in the wood supply system on logging business performance, to monitor the effects of externalities such as weather, tax law, fuel prices, labor legislation on business structures, and to gather information and insights that could lead to the development of better understanding of, and management tools for, the wood supply system.

This research project, funded in part by WSRI, is designed to expand the current work at Mississippi State University and to enhance the dissemination of this index to a broader audience.

This report presents the preliminary 2005 index based on a sample of 38 contractors for whom complete data were available on 11/25/2006.

This is the ninth in a series of reports from this project.


1 Preliminary 2005 Indices

1.1 Introduction

This report is based on 2005 final reports from 38 logging firms, all of whom participated in the 2004 reporting. The other firms from last year who are not included in this compilation are still participating and have provided much of their information, but key elements are missing or are being re-confirmed before inclusion.

1.2 Population

The 38 firms produced a total of 4,506,375 tons of wood with annual expenditures of $80,242,397. As a group, the firms produced 94,192 fewer tons in 2005 than in 2004. Sixteen contractors produced less, 19 produced more. The largest increase by a single firm was 109,555 tons; the greatest reduction was 107,665 tons. The magnitude of gains and losses in tons and percentages of 2004 production by individual firms is shown in Figure 1.2.1. When expressed as percentages of 2004 production, the gains and losses (columns) for individual firms were, for the most part, balanced. The volume change associated with each percentage change (the line) indicates that there was no particular pattern of gains and losses by firm size. The biggest percentage loss and the second largest percentage gain were experienced by large producers.

Figure 1.2.1 Annual change in production for individual firms between 2004 and 2005, ranked by percent change.
The firms are spread throughout the Eastern U.S. Participating firms operate in the Lake States and the Appalachian region, but the majority are located in the Southern Piedmont and Coastal Plain.

Differences in land forms and forest ownership patterns within physiographic regions, the mobility and versatility of the operations and changing markets make further stratification difficult. Many of the operations are located near the fall line, the border between the coastal plain and piedmont, and work in both regions. The Gulf South coastal plain includes land forms and land ownership patterns similar to the Eastern Piedmont.

The population includes firms that harvest pine and hardwood sawtimber, pine and hardwood pulpwood, conduct thinning operations, chipping operations, and operate Scandinavian style cut-to-length operations. Many of the participating firms move between thinning and clearcutting, tree-length and merchandizing, and operate as single or multiple crews as markets and opportunities dictate.

1.3 Average Total Cost per Ton Index

The 2005 preliminary Average Total Cost per Ton Index was developed by comparing the average cost for these 38 firms with that for the entire population in 2004. The index increased seven points as shown in Figure 1.3.1.

![Graph showing the Average Total Cost per Ton Index, Consumer Price Index, and Producer Price Index (Logging), 1995-2005P.](image-url)
The Consumer Price Index rose six points and the Producer Price Index (Logging) held stable for 2005. Logging costs, as measured by the index have increased a net 40% through the end of 2005. Prices paid for logging services, as measured by the PPI(Logging), have decreased 10%. The divergence between the logging cost index and the Producer Price Index for the period 1995-2005 increased to 52 points.

1.4 Annual Production

As in the past, the firms being discussed have been ranked by annual production and then split into three equal (or nearly equal) groups. The split for this preliminary report is affected by the absence of some of the small and mid-sized firms. The internal bounds, between the small and medium size groups and between the medium and large groups are possibly shifted from where they will be when the data set is complete. While these bounds may change as the data set is completed; the extremes are expected to remain as they are. As in the past, white space within the bar indicates the absence of contractors in that particular size range (Figure 1.4.1).

![Figure 1.4.1](image)

**Figure 1.4.1** Annual production by firm size, 1995-2005 preliminary. Small firms are indicated by blue, medium firms by yellow and large firms by green.

The spread of annual production between the smallest and largest firm is wider in this preliminary set (357,251 tons) than in the 2004 population (298,093). The smallest producer in 2004 held the same position in 2005, the largest producer has changed. The current largest firm was fourth from the largest in 2004, while the largest firm for 2004 fell back two positions.
1.5 Cost Indices by Firm Size

Average total cost per ton for the smaller firms shows a decrease in these preliminary data (Figure 1.5.1). The shift may be real, or a function of the firms not yet included, as described above. The firms not yet included tend to be specialty operations, hardwood loggers, thinning contractors, or more labor intensive operations.

![Graph showing cost indices by firm size, 1995-2005 Preliminary.](attachment:chart.png)

Figure 1.5.1 Average total logging cost indices by firm size, 1995-2005 Preliminary.

The index for the mid-sized firms shows a 30 point increase on top of the 26 point increase in 2004. The index for larger firms also increased but at a lesser (11 point) rate after being essentially static for two years.
1.6 **Distribution of Total Costs**

The distribution of expenditures across the six summary categories continued to change (Figure 1.6.1). The percent of total costs going toward equipment continued to decline, dropping from 15.4% in 2004 to 14.0% in 2005 preliminary analysis. This is the lowest level in the 15 years the study has been underway. Consumable supplies increased from 20.7% in 2004 to 22.6% in the preliminary 2005 data. Labor costs slipped down four tenths of a percent. Interestingly contracted services costs only increased by three tenths of a percent. Whether this was the result of reduced contract trucking by some of the firms, shorter haul distances as procurement areas shrunk, or simply a fluke of the data, it is surprising given the higher fuel costs late in the year.

![Figure 1.6.1 Cost components as a percentage of the average total logging cost per ton, 1995-2005 preliminary.](image)

The smaller cost components were reduced, possibly as cost control measures. Administrative overheads also fell back to 2003 levels. The percentage going for insurance (other than workers’ compensation, which is included in labor) decreased to the 2002 level. In summation, the increases in consumable supplies costs were countered by operational changes, holding labor and contracted services cost steady and reductions in equipment expenditures, insurance and administrative overheads. It remains to be seen if these changes were, in fact, economies or simply deferring costs into the future.
1.7 Component Cost Indices

Component cost per ton indices show year to year change in a more detailed manner. The changes described above do not occur uniformly across all firms. Each business owner makes operating and financial decisions based on the operating and financial conditions he or she faces. The rank order of individual firms therefore changes with cost categories. A relatively stable population of participants provides an opportunity to assess changes within the major expenditure categories by individual firms as well as the population as a whole.

1.7.1 Equipment

The equipment cost per ton index declined 2 points, from 111 to 109 between 2004 and 2005 (Figure 1.7.1.1). Equipment outlays, in nominal dollar terms have returned to near the 1995 levels; as a result they have decreased from 19% to 14% of total outlays. This cost element has risen most for small firms and least for the mid-size group (Figure 1.7.1.2). Twenty three of the 37 firms reduced their equipment outlays in 2005, two held constant and 13 increased their investment. Four of those 13 firms accounted for 70% of the increase (Figure 1.7.1.3).

Figure 1.7.1.1 Equipment cost/ton index.
Figure 1.7.1.2  Equipment cost per ton index by firm size.

Figure 1.7.1.3  Percentage and dollar changes in equipment expenditures by firm.
1.7.2 Consumable Supplies

Changes in fuel costs drove the index for consumable supplies upwards at the fastest rate over the life of the study, a 24 point increase from 139 to 164 (Figure 1.7.2.1). This is one cost center where there is little the contractor can do in the short run to affect outlays. Fuel is necessary to operate the equipment. Operational strategies, such as reducing the volume moved or shortening haul distances offer only limited relief. Some maintenance and repair costs can be deferred for a while but will have to be made at some time in the future. Again cost element volatility varied with firm size, with small firms being quite volatile before 2003 with mid-size firms showing the greatest increase in 2004 and 2005 (Figure 1.7.2.2). Twenty eight of the 38 firms increased their supplies cost, thirteen by more than 40% and three by more than 90% (Figure 1.7.2.3).

![Figure 1.7.2.1 Consumable supplies cost per ton index.](image-url)
Figure 1.7.2.2  Consumable supplies cost per ton indices by firm size.

Figure 1.7.2.3  Percentage and dollar change in consumable supplies expenditure by firm 2004-2005.
1.7.3 Total Labor

The labor cost per ton remained essentially flat, rising two points from 2004 to 2005 (Figure 1.7.3.1). Labor costs per ton by firm size indices diverged from 1995 to 2001 coming back together and moving upward in unison since (Figure 1.7.3.2). Sixteen firms reduced labor cost, while 20 had increases, eighteen of 20% or less. Eighty one percent of the increase in total outlays was attributable to one firm (Figure 1.7.3.3). This is one area where management can affect outlays, by forgoing raises, reducing crew size, or by reducing the scale of operations.

![Labor cost/ton index](image)

**Figure 1.7.3.1** Labor cost/ton index.
Figure 1.7.3.2  Total labor cost per ton indices by firm size.

Figure 1.7.3.3  Percentage and dollar changes in total labor costs by firm 2004-2005.
1.7.4 Contracted Services

The average cost per ton index for contracted services shows an interesting trend given the increase in fuel costs in late 2005. It rose only seven points, the smallest increase since the 2000-2001 period (Figure 1.7.4.1). Figure 1.7.4.2 demonstrates that the three different size grouping tended to outsource portions of their activity at different times. Small firms led, beginning in 1998, but by 2002 had re-internalized them. The large firms began outsourcing in 2001, and by 2005 seem to be pulling activities back in house. The mid-sized firms began outsourcing in 2003 and showed no move to retraction through 2005. The moves to re-internalizing may be the result of three forces, a reduction in the availability or dependability of contract trucking, curtailing haul distances, and an inability to compensate contract truckers for increased fuel costs because of static cut and haul rates. Overall, contracted services expenditures increased by $465,109. Again one firm was responsible for 81% of the net increase (Figure 1.7.4.3). The firm with the largest percentage increase (nearly 700%) was a small firm. The large relative increase for that one firm only accounted for only four percent of the total increase for the population. (The full height of the bar for the 38th position is too long to be shown!)

![Graph of Contracted Services Cost per Ton Index](image-url)

**Figure 1.7.4.1** Contracted services cost per ton index.
Figure 1.7.4.2  Contracted services cost per ton indices by firm size.

Figure 1.7.4.3  Percentage and dollar shifts in contracted services cost per ton 2004-2005.
1.7.5 Insurance

Insurance (exclusive of workers compensation) costs rose, but at a slower rate than that of the previous year, ending at 111 (Figure 1.7.5.1). Larger firms were most successful at controlling this cost, ending 2005 paying less per ton than in 1995. Smaller firms were most disadvantaged, paying nearly 80% more per ton than in 1995 (Figure 1.7.5.2). Again, the firms that reduced insurance costs (18) were balanced in number with those that had increased expenditures (18) and one firm accounted for most (75%) of the increase (Figure 1.7.5.3).

![Insurance cost per ton index](image)

Figure 1.7.5.1 Insurance cost per ton index.
Figure 1.7.5.2  Insurance cost per ton indices by firm size.

Figure 1.7.5.3  Percentage and dollar changes in insurance cost per ton.
1.7.6 Administrative Overheads

Administrative overheads include a diversity of costs not directly tied to production including legal and accounting services, office help, shop expenses, business (but not income) taxes, permits and bonds, phone and electrical service, uniforms, and a variety of “miscellaneous” expenses. As a consequence, the owner has some discretion in both the timing and amount of these expenditures as evidenced by the step like pattern of the index shown in Figure 1.7.6.1. This is the smallest cost segment, and about the only one that can be manipulated by forgoing some expenditures, or having the owner or family take on additional tasks. Again, the smaller firms demonstrate the greatest volatility, paying nearly 260+% of the 1995 amount per ton in three separate years. The overall trend for the mid and large firms has been decidedly upward (Figure 1.7.6.2). The index fell back between 2004 and 2005 as firms struggled to cope with rising fuel costs.

![Administrative Overheads cost per ton index.](image)
Figure 1.7.6.2  Administrative Overheads cost per ton index by firm size.

Figure 1.7.6.3  Percentage and dollar shifts in administrative overhead costs by firm.
1.7.7 Discussion

Consumable supplies costs have been on the increase since 2002; the rate of rise decreased slightly in this preliminary analysis. Labor cost per ton (which includes workers compensation insurance), the largest single expense category, remained relatively static, rising only ½ point. Labor, which in 2001 accounted for 34% of total costs, has fallen to 30.6% and has remained relatively stable over the last two years. The two components most sensitive to fuel costs, consumable supplies and contract trucking accounted for 41% of the direct costs per ton in 2000 and for 53% in 2005. The two smallest expense categories, insurance (other than workers comp) and administrative overheads fell back.
2 Discussion

As mentioned earlier, all of the 38 firms included in this preliminary analysis were participants in the study during 2004. This allowed analysis of year to year, same firm change (Table 2.1). Production for these 38 firms decreased by 94,192 tons, roughly 2.0% whereas costs increased by $3,835,925 or 5.0%.

Table 2.1 Shift in production and expenditures between 2004 and 2005 for 38 participating firms.

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Shift</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production (tons)</td>
<td>-94,192</td>
<td>-2.0%</td>
</tr>
<tr>
<td>Equipment</td>
<td>-$344,084</td>
<td>-2.9%</td>
</tr>
<tr>
<td>Consumables</td>
<td>$3,128,935</td>
<td>20.9%</td>
</tr>
<tr>
<td>Wages</td>
<td>$386,137</td>
<td>2.02%</td>
</tr>
<tr>
<td>Owner’s Draw</td>
<td>-$28,258</td>
<td>-1.32%</td>
</tr>
<tr>
<td>WCI</td>
<td>$129,297</td>
<td>9.00%</td>
</tr>
<tr>
<td>Total Labor</td>
<td>$487,176</td>
<td>2.1%</td>
</tr>
<tr>
<td>Insurance</td>
<td>$136,010</td>
<td>5.4%</td>
</tr>
<tr>
<td>Contract Services</td>
<td>$465,109</td>
<td>2.2%</td>
</tr>
<tr>
<td>AOH</td>
<td>-$37,221</td>
<td>-1.6%</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$3,835,925</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

Fuel prices have doubled over the 10 years included in this study, 20% of that increase occurred in 2005 with much of that occurring in the last half of the year. The rising cost of petroleum affected fuel costs in the short term, followed by later increases in other oil derivatives. Consumable supplies costs, which are dominated by fuel, but include tires and other rubber products, oil and lube, repair parts and services for these firms increased by 20.9%.

The firms made short term adjustments to cope with rising costs, foregoing investments in equipment, shortening haul distances, and trying to hold other costs stable. Their efforts were partially successful, but the economies of 2005 may have repercussions in the future.

Coping with this increase involved cutting the three elements within management control. Equipment expenditures, (depreciation, lease payments, and interest on money borrowed to finance equipment), were decreased. The owners draw decrease is most likely understated because it is tied to production, not profitability. Actual salaries of owners are not used in this analysis for reasons of confidentiality. A surrogate measure incorporating a fixed annual salary (which has been constant over the life of this study) to
reflect the owners’ labor input, and a production based allowance to reflect the owners’ managerial contribution (which has also been held constant over the 10 years of the study) is used instead. Details of the financial reports used to develop the indices show that many of the owner/managers significantly reduced the actual amount they took as salary. Administrative overhead costs – office expenses, professional (bookkeeping, accounting, and legal) services were reduced where possible.

The other cost components were market driven. Wages went up, in line with the overall increase in the cost of living. Insurance costs--workers compensation, general liability and vehicle--are also market driven, largely beyond the control of management.

As with any community, different firms made different accommodations during the year as a result of local conditions and management’s assessment of the future. Only one firm had a significant (>26,000 tons) increase in production over the previous year, five cut production by that much and more. The firm that made the greatest gain in production also had the greatest increase in other cost sectors. The downward trend in equipment investment, for example, would have been much greater without that operation’s help.

Simply calling 2005 a challenging year for the contractors would be an understatement. Weather played a major role, especially in the Gulf South, where Hurricanes Katrina and Rita disrupted both work schedules and markets for services. The storms’ effects on off-shore drilling, and on-shore refining, were at least partially responsible for the rapid rise in fuel costs, especially in the latter months of the year, had an effect on both in-woods and over-the-road operations. Re-structuring within the industry led to uncertainty concerning the future of individual firms, and the market for logging services. As described above, managers struggled to cope with these factors as best they could, and were, for the most part, successful in the short run.
Appendix

The following tables provide the source data used to develop the figures in the body of the report. They are numbered and structured to mimic the figures as closely as possible.

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Appendix

Table A1. Annual change in production for individual firms between 2004 and 2005P, ranked by percent change (Figure 1.2.1).

<table>
<thead>
<tr>
<th>Rank</th>
<th>Production change, 2004-2005P</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Tons</td>
</tr>
<tr>
<td>1</td>
<td>-107,665</td>
</tr>
<tr>
<td>2</td>
<td>-29,724</td>
</tr>
<tr>
<td>3</td>
<td>-21,420</td>
</tr>
<tr>
<td>4</td>
<td>-18,125</td>
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<tr>
<td>5</td>
<td>-52,278</td>
</tr>
<tr>
<td>6</td>
<td>-25,695</td>
</tr>
<tr>
<td>7</td>
<td>-5,571</td>
</tr>
<tr>
<td>8</td>
<td>-40,548</td>
</tr>
<tr>
<td>9</td>
<td>-22,823</td>
</tr>
<tr>
<td>10</td>
<td>-4,297</td>
</tr>
<tr>
<td>11</td>
<td>-8,870</td>
</tr>
<tr>
<td>12</td>
<td>-7,612</td>
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<td>37</td>
<td>109,555</td>
</tr>
<tr>
<td>38</td>
<td>19,052</td>
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Table A2. Average Total Logging Cost per Ton Index, Consumer Price Index, and Producer Price Index (Logging), 1995-2005P (Figure 1.3.1).

<table>
<thead>
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<th>Year</th>
<th>Cost/Ton Index</th>
<th>CPI</th>
<th>PPI-Contract Logging</th>
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<td>1995</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1996</td>
<td>108</td>
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<td>2005P</td>
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Table A3. Annual production by firm size, 1995-2005P (Figure 1.4.1).

<table>
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<tr>
<th>Year</th>
<th>Small Firms</th>
<th>Mid-Sized Firms</th>
<th>Large Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum  Maximum</td>
<td>Minimum  Maximum</td>
<td>Minimum  Maximum</td>
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<tr>
<td>1995</td>
<td>20,475  53,172</td>
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<td>101,352  244,950</td>
</tr>
<tr>
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<td>57,514  89,906</td>
<td>90,239  235,970</td>
</tr>
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<td>17,533  64,926</td>
<td>65,553  91,039</td>
<td>93,771  276,055</td>
</tr>
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<td>1998</td>
<td>12,975  56,278</td>
<td>63,871  84,119</td>
<td>87,722  228,168</td>
</tr>
<tr>
<td>1999</td>
<td>9,644   57,170</td>
<td>59,925  85,338</td>
<td>99,334  206,592</td>
</tr>
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<td>8,496   55,596</td>
<td>61,019  95,569</td>
<td>103,507 275,000</td>
</tr>
<tr>
<td>2001</td>
<td>2,649   52,633</td>
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</tr>
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<tr>
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<td>13,295  44,456</td>
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Table A4. Average total logging cost indices by firm size, 1995-2004 (Figure 1.5.1).

<table>
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<th>Large Firms</th>
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<td>100</td>
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</tr>
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<td>2005P</td>
<td>139</td>
<td>171</td>
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Table A5. Cost components as a percentage of total logging cost per ton, 1995-2005P (Figure 1.6.1).

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<tr>
<th>Year</th>
<th>Equipment</th>
<th>Consumables</th>
<th>Total Labor</th>
<th>Insurance</th>
<th>Contracted Services</th>
<th>AOH</th>
</tr>
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<tr>
<td>1995</td>
<td>19%</td>
<td>20%</td>
<td>34%</td>
<td>4%</td>
<td>21%</td>
<td>2%</td>
</tr>
<tr>
<td>1996</td>
<td>19%</td>
<td>21%</td>
<td>31%</td>
<td>4%</td>
<td>23%</td>
<td>2%</td>
</tr>
<tr>
<td>1997</td>
<td>19%</td>
<td>20%</td>
<td>31%</td>
<td>3%</td>
<td>25%</td>
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</tr>
<tr>
<td>1998</td>
<td>22%</td>
<td>18%</td>
<td>34%</td>
<td>3%</td>
<td>20%</td>
<td>3%</td>
</tr>
<tr>
<td>1999</td>
<td>22%</td>
<td>19%</td>
<td>33%</td>
<td>3%</td>
<td>20%</td>
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</tr>
<tr>
<td>2000</td>
<td>19%</td>
<td>22%</td>
<td>34%</td>
<td>3%</td>
<td>20%</td>
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</tr>
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<td>2001</td>
<td>20%</td>
<td>20%</td>
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<td>2002</td>
<td>18%</td>
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<td>34%</td>
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<td>23%</td>
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</tr>
<tr>
<td>2003</td>
<td>16%</td>
<td>20%</td>
<td>32%</td>
<td>3%</td>
<td>26%</td>
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</tr>
<tr>
<td>2004</td>
<td>15%</td>
<td>21%</td>
<td>30%</td>
<td>3%</td>
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<td>2005P</td>
<td>14%</td>
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<td>29%</td>
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Table A6. Component cost per ton indices for all participating firms. (Figures 1.7.1.1-1.7.6.1).

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<th>Year</th>
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<th>Total Labor</th>
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<th>Contracted Services</th>
<th>AOH</th>
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<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
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<td>93</td>
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<tr>
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<td>109</td>
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Table A7. Component cost per ton indices by firm size (Figure 1.7.1.2-1..7.6.2)

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<th>Contracted Services</th>
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<td>101</td>
<td>88</td>
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Table A8. Component cost per ton for individual firms (Figure 1.7.1.3-1.7.6.3).

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<th>Equipment</th>
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<th>Consumable Supplies</th>
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<th>Insurance</th>
<th>Admin. Overhead</th>
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<td>$</td>
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<td>$</td>
<td>$</td>
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<td>$47,036</td>
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