Southern Regional Production and Consumption Patterns of Pulpwood.

by

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Abstract

Accounting for over two thirds of the national pulping capacity, and with more than one hundred operating pulp mills, the South has experienced an overall increase in fiber production. As a result of the growth, extensive fiber supply patterns have developed within the region. This study will evaluate the interstate movement of pulpwood that occurs between the thirteen Southern states. The most current USDA Forest Service interstate import and export data are used to show the major distribution trends. Pulpwood consumption patterns can be explained by the timber production and pulpwood demand characteristics of individual states. A simple econometric model was developed to identify several of the key variables that influence wood-flow. Explanatory variables, such as state-level overall pulping capacity, average annual price of delivered timber, overall pulpwood production, total number of pulp mills, and total timberland acreage were tested. The evaluation of these characteristics will help determine the reasons for the flow of pulpwood that occurs in the South.

Introduction

In 1997 total U.S. production of paper reached an unprecedented level. In the same year the South experienced a pulpwood production increase of 11 percent to 75.9 million cords (Johnson and Steppleton 1999). With the increasing demand for paper and paperboard products comes increasing demand for wood fiber. In supplying mills with the necessary raw material, extensive distribution channels for pulpwood have developed in the South. Some of the channels that exist are of considerable distance; this fact is of interest because traditionally wood does not travel far from its point of origin. Guthrie (1972) noted that “…it is ordinarily uneconomic to transport wood far from its growing site because of the substantial weight loss involved in converting pulpwood, either roundwood or chips, to pulp. Pulpwood movements, therefore, are for relatively short distances, generally within states or between contiguous states.” This study evaluates the woodflow trends that exist between the thirteen southern states and attempts to determine some of the key variables that affect the import/export relationships between the states.

Methods and Data

The first step of this analysis was to look specifically at some of the more pronounced wood flows, 500 thousand cubic feet or more per year. The data for this part of the study was obtained from the USDA Forest Service in their “Timber Products Output and Use” resource bulletins. Figures were developed to graphically represent the woodflows between states.

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Figure 1. Alabama Exports (1995). (Johnson, Gober, and Nix 1998)

Figure 2. Alabama Imports (1995). (Johnson, Gober, and Nix 1998)

Figure 3. Arkansas Exports (1996). (Howell and Levins 1998)

Figure 4. Arkansas Imports (1996). (Howell and Levins 1998)

Figure 5. Florida Exports (1997). (Howell and Ford 1999)

Figure 6. Florida Imports (1997). (Howell and Ford 1999)
Figure 7. Georgia Exports (1997). (Johnson and Wells 1999)

Figure 8. Georgia Imports (1997). (Johnson and Wells 1999)

Figure 9. Kentucky Exports (1997). (Stratton and Lowe 1999)

Figure 10. Kentucky Imports (1997). (Stratton and Lowe 1999)

Figure 11. Louisiana Exports (1997). (Johnson and Steppleton 1999)

Figure 12. Louisiana Imports (1997). (Johnson and Steppleton 1999)
Figure 13. Mississippi Exports (1995). (Stratton, Howell, and Romedy 1998)

Figure 14. Mississippi Imports (1995). (Stratton, Howell, and Romedy 1998)

Figure 15. North Carolina Exports (1997). (Johnson and Brown 1999)

Figure 16. North Carolina Imports (1997). (Johnson and Brown 1999)

Figure 17. Oklahoma Exports (1996). (Howell and Johnson 1998)

Figure 18. Oklahoma Imports (1996). (Howell and Johnson 1998)
Figure 19. South Carolina Exports (1997). (Johnson and Bischoff 1999)

Figure 20. South Carolina Imports (1997). (Johnson and Bischoff 1999)

Figure 21. Tennessee Exports (1997). (Stratton and Wright 1999)

Figure 22. Tennessee Imports (1997). (Stratton and Wright 1999)

Figure 23. Texas Exports (1997). (Johnson and Steppleton 1999)

Figure 24. Texas Imports (1997). (Johnson and Steppleton 1999)
Wood Flow Patterns

There are several factors that could potentially impact the woodflow that occurs across state lines. Supply and demand characteristics of different regions within states certainly play a major role in affecting the import/export patterns that exist. The mills that exist in northeastern Florida are located very close to the Georgia border. Because of the high level of raw material needed in this area, a significant amount of the pulpwood Florida imports from Georgia is consumed in that area of concentration. It would seem that the same condition exists in southwestern Alabama. The number of mills that are located near the Mississippi border could account for the majority of Alabama’s imports from Mississippi.

Other factors that could influence wood movement are production patterns, consumption levels, and the resulting market price. These characteristics and their interactions should provide some insight into why the often costly transportation of pulpwood takes place.

Simple Econometric Model

A simple econometric model was tested to evaluate five independent variables that could affect the flows. The dependent variable used was the net woodflow, in standard cords, for each state in 1997. The independent variables tested were; state-by-state overall pulping capacity, average annual price of delivered timber, overall pulpwood production, total number of pulp mills, and total timberland acreage.

Results and Conclusions

Overall pulping capacity($X_1$) and total pulpwood production($X_2$) were the two variables that were significant contributors to explaining woodflow. Price, number of mills, and timberland acreage were not significant in the model.

Net woodflow (cords) = -540213 + 373.899$X_1$ - .597$X_2$ + $\mu_i$

The r-square for the model was .8875 and the t-values for $X_1$ and $X_2$ were 8.869 and −8.112 respectively. The Durbin-Watson test, with a test statistic of 1.59, indicated no first order autocorrelation. These results seem reasonable because pulping capacity basically represents the wood fiber demand for a given state. If a state has a higher pulping capacity, its demand for fiber would be higher so it would be more likely to import pulpwood to supply its requirements. Also, if a state produced a large amount of wood relative to its surrounding states it would have a greater propensity to export.

The next step in this analysis is to look at the other potential factors that could affect the flow. Mill distributions and their proximity to state borders will be evaluated. If a facility is located near a state border it would most likely source wood from both states or in some cases, several states. Geographical Information System technology will be utilized to conduct the analysis. Other factors to be evaluated include annual precipitation, transportation costs, and market conditions.
Literature Cited


