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Assessing Benefits and Costs of Rail Mergers

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With the recent merger of two of the nation's largest railroads, the Union Pacific and the Southern Pacific, and still more recently the bid by Norfolk Southern and CSX to purchase Conrail, questions have again arisen concerning the desirability of preserving competition in the face of rail mergers. Several observers have suggested that policies should be in place which preserve some level of intramodal competition, because of its effectiveness in maintaining low rates. However, if maximizing societal welfare is the goal of merger policy, resource costs must be considered as well.

In sorting out the costs and benefits of mergers, important questions must be addressed: Are railroads natural monopolies in specific markets? In multiple markets? What is the potential for cost savings resulting from end-to-end mergers?

Cost Subadditivity the Condition for Natural Monopoly

To assess the most efficient industry configuration, many studies have examined the cost structure of regulated industries. Most have done so, however, by testing for economies of scale and/or scope, conditions that are not in themselves sufficient for natural monopoly in cases in which firms produce more than one type of product (or service).
In these cases, a natural monopoly exists in terms of *strict cost subadditivity:* outputs produced at a lower cost by one firm than by any combination of firms.

Modeling Railroads as Multi-Product Firms

In estimating a railroad cost function, our study examines three distinct types of outputs, or services:

- **Unit train services:** trains dedicated to the movement of a single commodity between an origin/destination pair, and provided routinely to extremely high volume shippers; unit trains are the most efficient service provided by railroads.

- **Way train services:** gathering cars and bringing them to major freight terminals; these are the highest cost service because of high switching requirements, small shipment sizes, short distances, and slow train speeds.

- **Through train services:** train services provided between two or more major freight terminals; through trains are more efficient than way train service because of traveling greater distances at higher speeds, but are less efficient than unit train services.

Study Finds Railroads Are Natural Monopolies in Fixed Networks and Over Multiple Markets

This study finds that railroads realize cost subadditivity and, therefore, are natural monopolies over a fixed network. In assessing the condition of cost subadditivity in specific markets, this study

performed cost simulations for 188 observations, each with 365 combinations; thus, 68,620 simulations were performed. Cost subadditivity was met for all 188 observations, clearly indicating that Class I railroads are natural monopolies over a fixed network size — that is, where the alternative to one-firm service would be separate firms serving the same markets over duplicate track. This suggests that duplicate service over the Class I rail network would result in excess resource costs.

This study further found, in assessing cost subadditivity when allowing network size and train miles to vary, Class I railroads are also natural monopolies over multiple markets— that is, where end-to-end mergers would increase the overall size of the network.

In examining subadditivity, it is important to model the multi-product nature of railroads. Statistical tests show significant differences in modeling railroads as multi-product versus single-product firms. Moreover, subadditivity simulations using a single output specification produce much weaker support for the concept of railroads as a natural monopoly over multiple markets. This may partially explain the findings of previous studies, which found a lack of cost benefits resulting from increased railroad size. It must be noted that a full assessment of the impact of intramodal competition on societal welfare would require an examination of competition's role in limiting carrier pricing power, as well.

Conclusion

With major mergers in the U.S. railroad industry, discussion has focused on the appropriate role of the Surface Transportation Board in merger oversight, the need to preserve competition in the face of mergers, and the impacts of end-to-end mergers on railroad costs. Cost considerations are essential in making well-informed decisions about the desirability of mergers and their potential impacts on society.

In analyzing cost subadditivity, this study found evidence to suggest that:

- **Railroads are indeed natural monopolies over a fixed network size,** so that duplicate networks serving the same markets would result in increased costs. This suggests that maintaining competition in markets impacted by horizontal mergers is not justified by railroad cost considerations.

- **Railroads are natural monopolies over multiple markets,** so that the recent mega-mergers have had some real benefits. (Service quality may also improve as the result of mergers.)

A copy of the full report, "Railroad Cost Considerations and the Benefits/Costs of Mergers" (MPC Report No. 97-80), is available from the Upper Great Plains Transportation Institute. Contact: John Bitzan (701) 231-8949.