



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

NC

67

ECONOMICS
SPECIAL
REPORT

AAEA FOUNDATION OF
APPLIED ECONOMICS

WITHDRAWN
SEP 7 1981

RAILROADS: COST, CAPACITY AND CRISIS

Marc A. Johnson

Economics Special Report No. 67

Department of Economics
North Carolina State University
Raleigh, North Carolina
July, 1981

AAEA paper presented at its annual meetings,

Clemson, SC July 26-29, 1981

DEPARTMENT OF ECONOMICS AND BUSINESS
NORTH CAROLINA STATE UNIVERSITY
RALEIGH, NORTH CAROLINA

RAILROADS: COST, CAPACITY AND CRISIS

Marc A. Johnson

Economics Special Report No. 67

**Department of Economics
North Carolina State University
Raleigh, North Carolina
July, 1981**

AAEA paper presented at its annual meetings,

Clemson, SC July 26-29, 1981

RAILROADS: COST, CAPACITY AND CRISIS*

Marc A. Johnson**

The railroad industry is, indeed, in transition. The industry has been given a new lease on life. The Railroad Revitalization and Regulatory Reform Act of 1976 (4-R Act) introduced rate flexibility and improved opportunities for mergers and line abandonments. The Staggers Rail Act of 1980 expanded rate flexibility and instituted contract and exempt carriage for railroads. Since A. Daniel O'Neal, the ICC has approached railroading as an industry operating in the private sector, rather than as a public enterprise like the Post Office. The purpose of this short paper is to focus sharply on the flaws of remaining cost-based regulation and planning. Since the paper serves as a discussion document for a symposium, the author provides judgmental conclusions based upon economic principles.

Government activity in the railroad industry is now largely based on cost-of-production criteria. Minimum and maximum rail rate thresholds are set at variable cost and at "cost recovery percentages" of variable cost, respectively. Branch line surcharges

* A paper presented for a symposium entitled "Agricultural Transportation in Transition: Issues and Policy" at the American Agricultural Economics Association meeting at Clemson University, July 27, 1981.

** Associate Professor of Economics and Business, North Carolina State University. The author acknowledges helpful comments by E. C. Pasour, Jr. and Daniel A. Sumner.

and purchase agreements, and service continuation are based on cost criteria. The railcar shortage and railroad capital "needs" issues are viewed as crises as a result of erroneous cost concepts. Consequently, the soundness of regulation and planning depends upon the soundness of cost concepts used to implement regulation and planning.

Economic costs which motivate the choices of decision-makers are opportunity costs. The opportunity cost of placing resources in one use equals the anticipated value attainable if the same resources were placed in the best alternative use. Costs are forward-looking and dynamic. The cost of leaving a rail branch line on the ground or adding a car to a particular grain movement is evaluated as the value of other uses of capital, steel rails, cars, power and labor. These cost estimates are time and location specific. They are specific to the decision-maker due to his level of knowledge and his perception of likely future events (Pasour). Accurate cost measures cannot be reconstructed after the fact, especially by outside observers, because the specific set of opportunities available at the moment of decision cannot be recreated (Buchanan, p. viii; Vickers, p. 26).

Rate Regulation

Cost evaluations of railroad managers depend upon managers' perceptions of traffic density, backhaul probabilities, shipment regularity, terminal congestion and uncertainty (Turvey). The cost of moving a carload of grain from point A to point B is different at

different times, is different than the cost of moving from B to A and is different from moving an equal distance between two other points. The uniqueness of cost estimates with respect to time, location and decision-maker makes it virtually impossible for a shipper or another railroad legitimately to protest a rate as being too high or too low relative to the railroad's opportunity cost.

When setting regulatory guidelines, the complexity and dynamics of opportunity cost typically are abandoned in favor of simple, static, certain, historical expense formulas based on accounting data--the historical record (Turvey). However, historical expense formulas do not account for timely variations in opportunity cost caused by changing shipping opportunities, peak demands, congestion, idle resources, joint products and anticipated policy moves. Expense formulas can underestimate costs in the presence of heavy traffic, full capacity utilization and congestion. Expense formulas can overestimate costs in the presence of idle resources (Johnson and Pasour). The use of average, industry cost estimates as regulatory thresholds neither recognizes the unique circumstances of particular firms nor the unique circumstances of particular movements. As a result, average industry expense criteria insulate decision-makers from marginal cost market signals, thereby creating barriers to offering innovative, low-cost service and barriers to offering high-cost service at all.

Section 205 of the 4-R Act instructs the ICC to determine, and assist railroads in achieving, an "adequate rate of return to

capital." This rate of return figure is used to test the "reasonableness" of general rate increase proposals and to determine which railroads qualify for special privileges afforded railroads with inadequate revenues. Single, industry-wide, return on investment standards have been calculated annually:

1978	10.60% (Ex Parte 353, 12-5-78)
1979	11.00% (Ex Parte 363, 10-31-79)
1980	11.22% (Ex Parte 381, 11-12-80)
1981	11.70% (Ex Parte 393, 3-30-81)

The opportunity cost of capital is not so static that a single calculation can apply to all firms in an industry for an entire year.

The concept of "opportunity cost" in evaluating the cost of maintaining a branch line was first recognized in a 1980 Texas and Pacific line abandonment case. "Opportunity cost" was calculated as the "adequate revenue" rate of return figure multiplied by the liquidation value of the line. Essentially, the industry's average rate of return standard is applied where an entrepreneur would apply a marginal cost of capital estimate. This "opportunity cost" approach bears little resemblance to the economist's definition.

Minimum rates are regulated at no less than "variable cost" and maximum rates fall into ICC jurisdiction when they exceed a "cost recovery percentage" (CRP) which is stated as a percent of "variable cost." The 1981 estimate of the industry-wide "cost recovery percentage" is 197.5 percent of "variable cost" (Ex Parte 399, 4-1-81). The CRP calculation is based on Rail Form A

(accounting) data of 1977. "Variable costs" are calculated from similar data. These backward-looking, expense procedures for calculating cost do not conform to the dynamic, forward-looking concept of opportunity cost (Turvey). Consequently, these expense estimates do not represent costs which influence choices of firms in the industry and, thereby, do not contribute toward the objective of Congress to foster an efficient transportation system (Pasour).

Branch line surcharges are regulated with all of the above expense estimators. Branch line surcharges can be set up to 110 percent of the "variable cost" of moving the traffic plus 100 percent of "reasonable expected costs" of continuing to operate the line segment (Ex Parte 402). The formula can be restated as: average, variable traffic expense plus an apportioned share of overhead expense. A railroad decision-maker will decide to serve a high-cost branch line, regardless of how many big-shipper clients he has, as long as the anticipated price he can charge for service at least equals marginal opportunity cost (Clemens). If average cost of the rail system is higher with operation of a particular, low-traffic branch line than without, marginal cost will lie above average variable cost. If anticipated marginal opportunity cost exceeds the industry average variable expense by more than 10 percent, the regulation will be responsible for terminating service.

The Railcar Shortage "Crisis"

Consideration of the "railcar shortage crisis" here and the "capital needs crisis" in the next section is done to focus attention on cost concepts as well as to emphasize the arrogance of some government planners in their association with industry decision-makers. During the summer of 1977, with declining grain export activity in the presence of fixed, published rates, the railroad industry slipped into a car surplus position. By early 1978, grain exports had surged and a severe railcar shortage occurred. Country to port turnaround times for cars rose and fell with export movement demand quantities during the period. The grain export surge was sustained through 1980 along with the railcar shortage. From 1978 to 1980 railroads responded to the continuous grain export surge by increasing quantities of grain hauled in each year and by investing in hopper cars. Railroads experienced congestion in line-haul yards and port terminals. When traffic surges, yard delays and congestion are normal events (Turvey).

A General Accounting Office (GAO) report released April 8, 1981, assesses the grain car shortage crisis. The GAO concludes that since total bushels of space in railcars have been increasing continuously, "railcar unavailability seems to be primarily caused by inefficient railcar use" (p. 25). Further, the GAO concludes that "railroads have not made any concerted effort to reduce railcar turnaround times" (p. 21). Thus, after three years of very

substantial grain movements for export, the GAO says that railroads are inefficient in their handling of cars and, what's more, they don't care enough about their multi-million dollar investment to use it and protect it. That is arrogance. To add insult to injury, these judgments appear as grain export volume tempers and railroads find themselves with idle car capacity again.

What is "efficient railcar use"? Efficiency is in the mind of the decision-maker. An action is "efficient when the decision-maker has no preferred alternatives, given the circumstances" (Pasour and Bullock, p. 335). Circumstances include the goals of rail management, imperfect and costly information, short-term capacity restrictions in other components of the rail system and port terminals, ship arrival reliability and service demands of non-grain shippers. To achieve an efficiency norm set by an outside agency unfamiliar with industry circumstances could be very costly. Lower turnaround time for cars can be achieved by building more storage at ocean terminals and more yard capacity. But to build either car, yard or storage capacity to handle record movements likely would call for a physical plant with substantial idle capacity most of the time. Idle capacity is expensive in terms of continuous service enhancement activities foregone. Sporadic congestion in the presence of variable traffic volume is not necessarily inefficient. For any decision-maker, at any moment, there is an optimal amount of congestion. Current investment activity in coal

hauling facilities in response to projected high export volumes and current port congestion suggests that railroad companies do respond to opportunities.

The "Capital Needs" Crisis

In October, 1978, the U.S. Department of Transportation issued a report called "A Prospectus for Change in the Freight Railroad Industry." Report results made front-page news, which is unusual for transportation issues other than labor strikes and derailments. The report concluded that railroads would "need" \$42 billion of capital during the next 10 years to maintain normal service (p. 67). In constant dollars "needs" were \$29 billion and the DOT estimate of short-fall in industry ability to attract capital was \$3 billion. However, the initial procedure used by the agency is recorded in the Appendix (pp. 147-50). The DOT initially requested submissions of anticipated capital "needs" and sources from the railroad industry. The industry projected an ability to obtain all projected capital requirements in the market. The \$3 billion short-fall was created by agency judgments that railroad finance departments had: a) underestimated the number of cars the railroads should be buying, b) underestimated the maintenance expenditures required to run a railroad, and c) overestimated retained earnings potential. It is difficult to accept that superior knowledge of railroad company futures exists in a federal agency than in the finance departments of individual railroads.

Railroads don't "need" capital, they demand it and like for other goods and services, less is demanded at a higher price. The demand for capital is derived from the demand for rail service. The supply of capital to the railroads is a function of opportunity costs of capital for railroad companies (supplying from retained earnings) as well as external investors. The amount of capital flowing to the railroad industry in the next 10 years will depend on how well the railroads perform financially relative to other industries, i.e., how well they provide the best dividend and interest package net of risk. When evaluating their supply of capital to railroads, investors will be looking at future potentials rather than the current circumstances assumed by the Department of Transportation.

Conclusion

Cost-based rate and rate of return regulation is doomed to failure. Cost criteria based on average, historical expense standards do not represent choice-influencing costs. Consequently, these standards serve as barriers to industry innovators. If regulation is to be maintained, behavioral indicators of monopoly practices should replace cost-based indicators. In this manner the railroad industry can operate in response to market opportunities limited only by anti-competitive behavioral restrictions such as rules barring price fixing and territorial allocation.

Railroad planning by nonrailroad agencies is doomed to failure. Identification of traffic demand and opportunity costs of transportation facilities and other resources can only be done by managers making the decisions. Identification of demand and cost will be imperfect and results will diverge from an ideal optimum due to imperfect knowledge of the future. However, with the tendency of outside agencies to focus on only one system component at a time and with the inability of an agency to obtain the data necessary to evaluate railroad opportunities, results of railroad management decisions will probably be closer to an ideal optimum than the results of agency decisions.

References

- Buchanan, James M., Cost and Choice: An Inquiry in Economic Theory. Chicago: Markham Publishing Company, 1969.
- Clemens, Eli, "Price Discrimination and the Multiple-Product Firm." R. E. Stud. (1951-52): 1-11.
- General Accounting Office. U.S. Grain Transportation Network Needs System Perspective to Meet Future World Needs. Washington, D.C.: Report CED-81-59, GAO, April 8, 1981.
- Johnson, Marc A. and E. C. Pasour, Jr. "An Opportunity Cost View of Fixed Asset Theory and the Overproduction Trap." Amer. J. Agr. Econ. 63 (1981): 1-7.
- Pasour, E. C., Jr. "Cost of Production: A Defensible Basis for Agricultural Price Supports?" Amer. J. Agr. Econ. 62 (1980): 244-48.
- Pasour, E. C., Jr. and J. Bruce Bullock. "Implications of Uncertainty for the Measurement of Efficiency." Amer. J. Agr. Econ. 57 (1975): 335-39.
- Turvey, Ralph. "The Analysis of Economic Costs and Expenses in Road and Rail Transport." Brussels: A Memo Prepared for the Commission of the European Communities, Transport Series No. 4, April, 1975.
- U.S Department of Transportation. A Prospectus for Change in the Freight Railroad Industry: A Preliminary Report by the Secretary of Transportation. Washington, D.C.: USDOT, October, 1978.
- Vickers, Douglas. Financial Markets in the Capitalist Process, University of Pennsylvania Press, 1978.

