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Constrained Market Pricing and Revenue Adequacy: Regulatory Implications for Shippers and Class I U.S. Freight Railroads (Summary)

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This is a summary of Staff Paper P15-5, "Constrained Market Pricing and Revenue Adequacy: Regulatory Implications for Shippers and Class I U.S. Freight Railroads" by Gerard J. McCullough, Department of Applied Economics, College of Food, Agricultural, and Natural Resource Sciences, University of Minnesota. This paper was developed with funding from the Agricultural Marketing Service (AMS) through cooperative agreement number 14-TMXXX-MN-0030. The full paper is available at http://ageconsearch.umn.edu/handle/207766.

What is the Issue?

On April 1, 2014, the U.S. Surface Transportation Board (STB or Board) announced an *ex parte* proceeding (EP 722) to evaluate the relationship between revenue adequacy and the procedures it uses to judge the reasonableness of railroad freight rates. The announcement raised the possibility that the Board would revise or supplement the Constrained Market Pricing (CMP) approach to rate regulation adopted following the Staggers Rail Act of 1980. In response to the announcement, USDA's Agricultural Marketing Service (AMS) funded research by McCullough at the University of Minnesota to explore and explain the regulatory concepts that the STB would potentially change through the proceeding.

In terms of background, the Interstate Commerce Commission (ICC)—STB's predecessor agency-- chose CMP as a "practical solution" to the problem of identifying Ramsey prices for the railroad industry. Ramsey pricing (sometimes called differential pricing) is a theoretical ideal that economists have proposed for regulating a monopoly with high fixed costs when government subsidies are not available.

Under CMP, a rail shipper cannot be required to pay more than the estimated *stand-alone cost* (SAC) of the service it receives. The SAC procedure is the process ICC and STB have used to identify the approximate Ramsey price. However, ICC warned at the time of adoption that this CMP approach is based on "sophisticated economic theories which require careful interpretation and application." Since adoption, shippers have been critical of this approach, saying the SAC process is not fair because it is too expensive and time-consuming to be of practical use in rate disputes.

McCullough's paper reviews the history of freight railroad regulation in the United States since 1980 and analyzes the development of CMP and revenue adequacy as regulatory mechanisms. The paper identifies several questions the STB—along with affected policymakers and rail market participants–should consider in evaluating the relationship between CMP and revenue adequacy. The study also provides two appendixes. Appendix A provides empirical estimates of the direct economic effects of a hypothetical revenue-adequacy-based rate regulatory regime. Appendix B summarizes arguments made by carriers' and shippers' experts and others in filings in EP 722.

What did the study find?

The critical economic doctrine articulated in the Staggers Rail Act and operationalized by current railroad regulatory mechanisms is that market-based prices (demand-side signals) are at least as important as costs (supply-side characteristics) in enabling the complex railroad industry network to evolve and to adapt to the needs of a modern economy. In applying this doctrine over the past 30 years, the ICC and its successor agency, the STB, have relied on CMP, which is a novel and sophisticated regulatory approach. Railroads support the approach, while shippers do not support it.

McCullough's paper analyzes the history of rail regulation and suggests several questions that STB-affected stakeholders should consider about the relationship between rail revenue adequacy and SAC. We discuss the four questions below.

1. ***Does the STB's revenue adequacy measure define a floor or ceiling for the revenues of Class I freight railroads?***

The revenue adequacy measure developed by the U.S. Department of Transportation in the late 1970s and legislated by Congress in 1980 was a lower bound aimed at protecting railroads by constraining the behavior of regulators. The legislative history describes it as the revenue level that enables railroads to continue to operate as private enterprises. Revenue levels below that bound over an extended period, presumably, would force railroads into bankruptcy and shutdown unless the Federal Government provided support. An alternate description of revenue adequacy, articulated in regulations (the so-called *Coal Rate Guidelines*) by the ICC 5 years later, is of an upper bound, aimed at protecting shippers by constraining the behavior of railroads. The ICC describes it as the *highest* level of revenue to which regulated railroads are entitled. Above that bound, the *Guidelines* state, "captive shippers should not be required to pay differentially higher rates than other shippers."

In perfect theory, there is no *direct* contradiction between the 1980 congressional view of revenue adequacy and the 1985 ICC view. One could imagine a perfect theoretical level of revenue adequacy, a razor's edge, which could serve as both lower bound and upper bound for revenue. It is difficult to imagine, though, how the STB could accurately determine or prudentially apply this revenue level. The *Guidelines* recognize this difficulty. They stress that revenue adequacy is a long-term concept, that railroads are subject to the business cycle like other firms, and that the constraint should not be used to "freeze" a carrier's revenue at the break-even point. On the other hand, most reasonable people would say that railroads should not be entitled to ever-increasing revenues with no constraint ever. Nevertheless, as the STB notes in announcing EP 722, the details of how they would apply constraint in rate cases have not been worked out.

2. ***Are the revenue adequacy and the stand-alone cost constraints mutually exclusive procedural alternatives or can they be applied jointly in STB rate reasonableness proceedings?***

Derivation of Ramsey prices requires the use of a mathematical technique, which guarantees that markups over marginal cost cover the total economic cost of a firm's operations. The question, though, is whether an accounting-based revenue adequacy constraint is consistent with Ramsey pricing—or with the CMP process, whether rates and subsequent revenue levels are constrained by real competition in some markets and by simulated competition using the SAC test in others.

In practice, the revenue adequacy constraint and the stand-alone cost constraint have been used as procedural alternatives. The SAC test has been used to identify "approximate" Ramsey prices for particular sets of shipments. The *Guidelines* do not provide clear guidance on how the two constraints could be integrated into a single CMP procedure. Proponents of SAC might argue that a full set of existing railroad rates, arrived at through a combination of actual competition and SAC-simulated competition, generate revenue levels that are competitively determined and are therefore *de facto* revenue adequate. From a procedural perspective, however, it seems clear that one must view the two key constraints in CMP as alternative regulatory procedures.

3. ***Do the simplified procedures that the STB has adopted since the* Guidelines *provide reasonable alternatives to full SAC proceedings in cases where a defendant railroad is not revenue adequate?***

In 1996, when it first adopted simplified procedures for determining rate reasonableness, the STB warned that these procedures, based primarily on estimates from the Uniform Rail Costing System (URCS), were "much cruder" than CMP. In its 2010 *Report to Congress on the Uniform Rail Costing System*, however, the STB noted that cost-based regulatory methods would play "a more prominent role in determining whether a rate is reasonable and what relief a rail shipper should receive."

Opponents of SAC have argued that the SAC test has become too expensive and too time-consuming and that it is time to retire the notion and replace it with a simpler mechanism, possibly a price-to-variable-cost ceiling. They acknowledge the difficulty of measuring variable costs but argue that URCS "is already a standard methodology for this." Other economists, including the Transportation Research Board's (TRB) Committee on Modernizing Freight Railroad Regulation, have been more skeptical of URCS's ability to accurately estimate movement-specific variable costs.

There is no reason why the STB could not initiate other procedural changes (e.g. not based on URCS) to make the SAC procedure more accessible and more efficient. However, a simplified SAC would likely still face methodological challenges. To approximate ideal Ramsey prices, the SAC procedure must be able to identify prices that lie somewhere between incremental costs and stand-alone costs. The *Guidelines* address this procedurally by giving complaining shippers the right to add non-complaining shippers to the SAC traffic group to share costs. They recommend that the rates paid by non-complaining shippers be allocated "on the basis of Ramsey principles," but implementation of this suggestion has been contentious.

4. ***Should SAC-based rate regulation be abandoned in cases where a defendant railroad is revenue adequate and replaced by a revenue adequacy-based procedure?***

The goal of STB intervention in captive rail markets is to duplicate the outcomes that would occur in competitive markets. How can the STB achieve this goal using the administrative tools at its disposal?

One approach would require that the rate charged by a regulated railroad for an individual freight movement not exceed the average variable cost of that movement by an unreasonable amount. This is the revenue-to-variable cost test. It makes sense because large revenue-to-variable cost margins do not exist in competitive markets where they attract entry by competing firms.

A second approach would require that the revenue a regulated railroad receives for serving a particular customer or set of customers not exceed the total cost of providing that service. This is the stand-alone cost test. It makes sense because revenues that exceed stand-alone cost in competitive markets would also attract entry by competing firms.

A third approach would require that the total revenue the regulated railroad receives not exceed the overall total costs—capital costs included—of viable multi-year operations. This is the revenue adequacy test. It makes sense because firms operating successfully in competitive markets are expected to make what the STB's governing statute terms "a reasonable and economic profit or return (or both) on capital employed in the business."

In each of the three approaches, the STB *observes* the rates that a railroad charges (or proposes to charge) and the revenue it actually receives (or would receive under a set of proposed rates). In each of these approaches, though, the STB must depend on *estimates* of the costs involved, and this is where the difficulties begin. At one end of the spectrum is the difficulty of estimating the variable costs of specific point-to-point rail movements. At the other end is the difficulty of estimating the multi-period cost structure of a "revenue adequate" Class I railroad that must respond to changing operating requirements and changing investment horizons. Between the two is the difficulty of measuring the stand-alone costs of providing service on a hypothetical rail system to a particular shipper or set of shippers.

STB faces significant potential challenges here. One is to identify which, if any, of the three regulatory processes allows for the accurate *measurement* of rail costs. The other is to identify which of the *procedures* best approximates competitive market outcomes. Underlining the importance of these challenges is the TRB Committee on Modernizing Freight Regulation's conclusion that none of the three potential STB approaches mentioned above works very well.

The TRB Committee recommended that Congress simply eliminate the STB's direct role in maximum rate determinations. It suggested that rate disputes be handled, as they are in Canada, by independent arbitrators and that competitive rate benchmarking replace URCS in screening rates for eligibility to be challenged. The TRB Committee characterized the SAC process as "slow, costly, and inappropriate to many shippers." It cited, as an example, the problems that grain shippers would face in using SAC.

> Grain shippers in particular have argued that the design of a standalone railroad entails large litigation expenses that cannot be justified when a grievance involves a relatively small claim. In addition, these shippers, whose traffic may not be the dominant flow (or remotely close to it) in a corridor or set of corridors, must depend heavily on the profits generated by any

crossover traffic to cover common costs and lower the revenue-adequate rate as determined by SAC. These profit contributions, in turn, are computed from R/VC markups derived from the unreliable URCS. Complainant shippers can therefore face substantial uncertainty about a fundamental aspect of their SAC case.

The report was even more critical of the STB's use of the revenue-to-variable cost criteria in its *Three Benchmark Approach* and *Simplified-SAC* procedures, which are dependent on the "unreliable and arbitrary cost allocations of URCS" and offer in the words of TRB, "even less predictable decision criteria and lack even [SAC's] weak conceptual basis." The report also recommended elimination of the STB's annual revenue adequacy determination, which it characterized as "ritualistic, while offering little substantive information for regulators or policymakers."

When the STB announced its decision to receive comments in EP 722, it said that it would focus on two issues—its methodology for "determining" revenue adequacy and its "use" of revenue adequacy in rate proceedings. The focus of McCullough's research was on the latter task, the potential regulatory application of revenue adequacy, as opposed to the regulatory measurement of revenue adequacy. Both issues are important, of course, and it may be that the STB will focus its decision on the measurement of revenue adequacy. However, as discussed in the paper, EP 722 also presents a timely opportunity for the Board to address fundamental questions about regulatory procedure that are of importance to shippers, carriers, the public, and to the STB itself.

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