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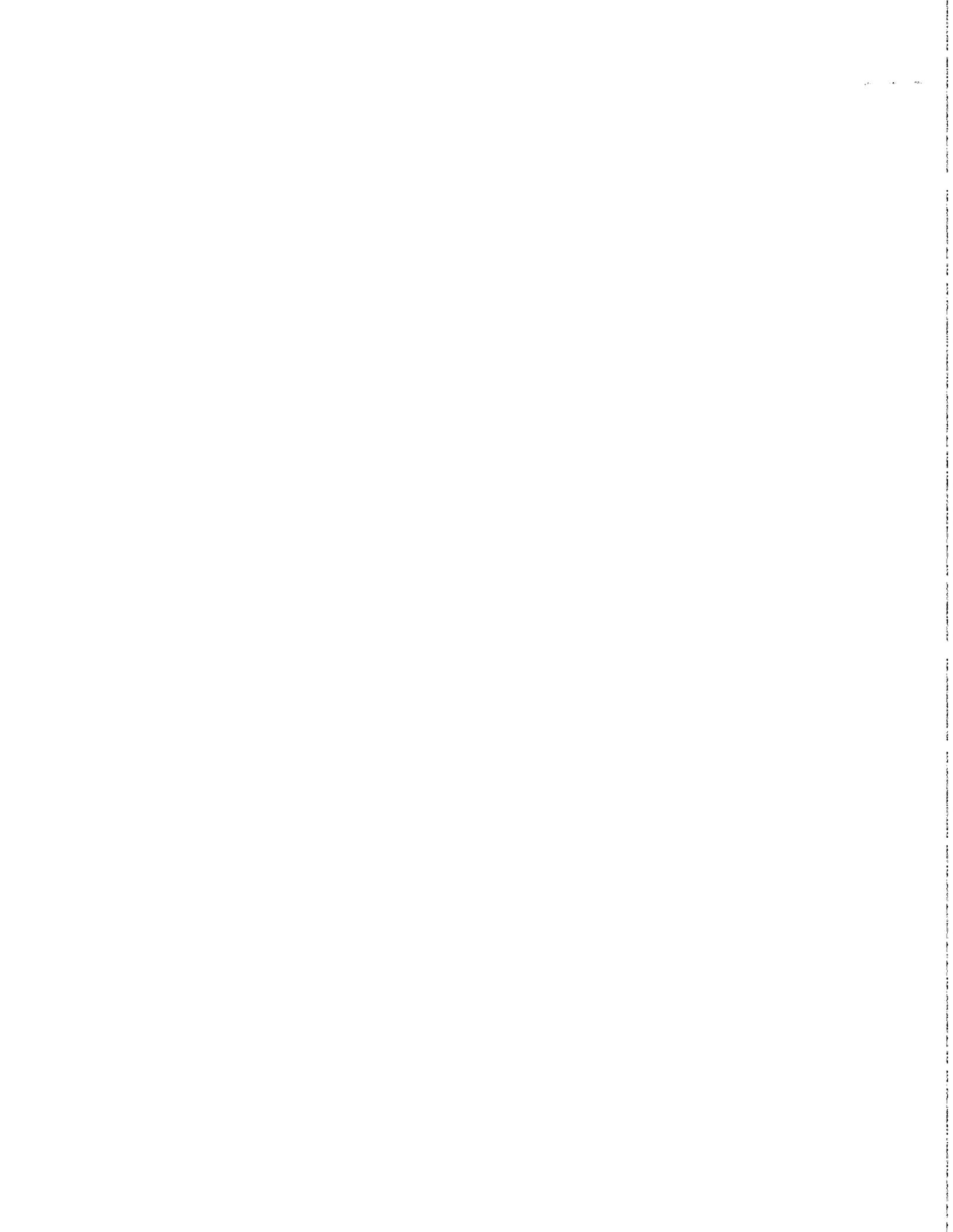
# RAILROAD ACCOUNTING PRINCIPLES

FINAL REPORT

September 1, 1987  
Volume 2—Detailed Report

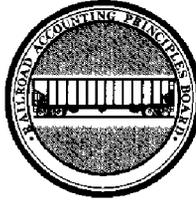


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September 1, 1987

The President of the Senate  
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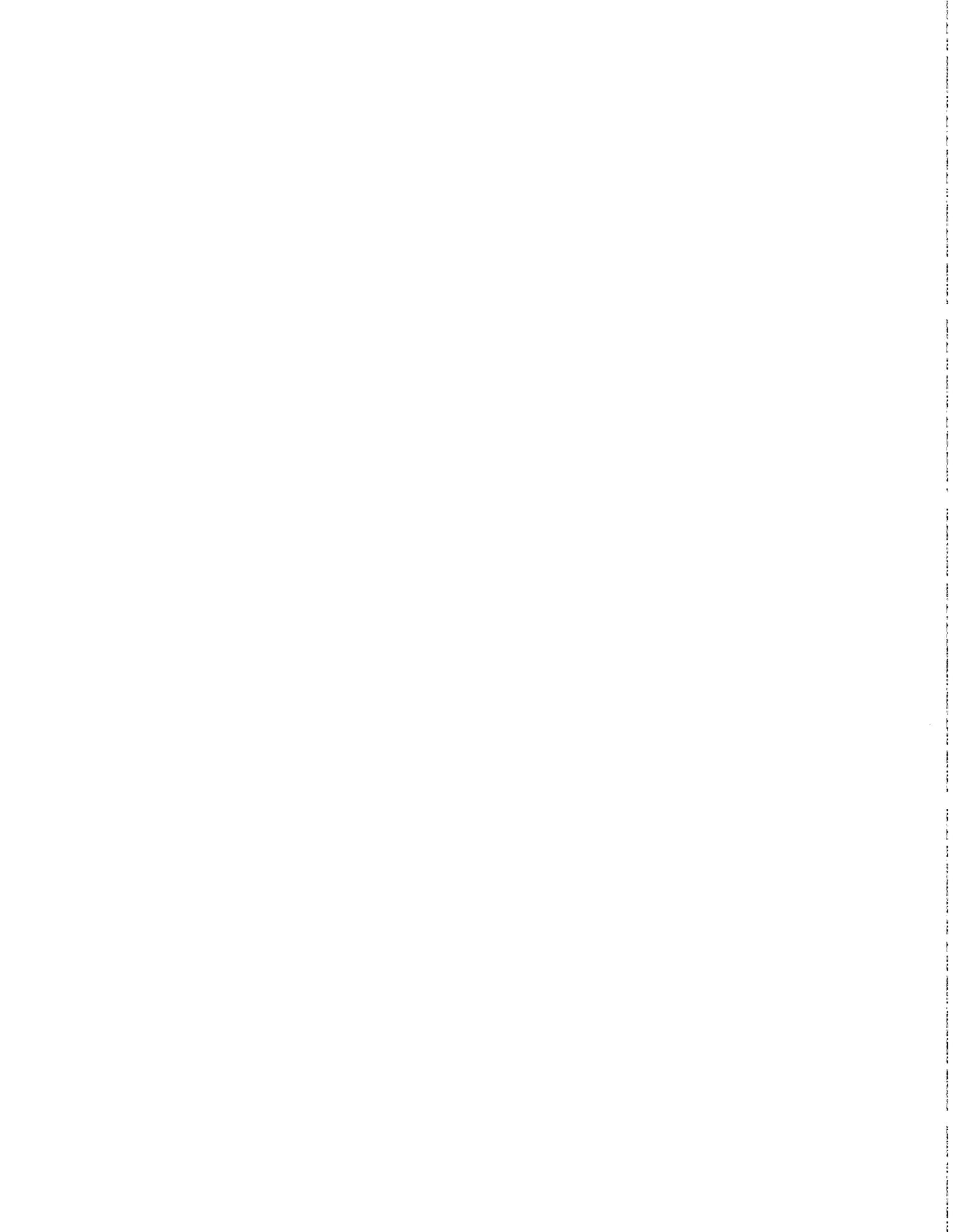
Enclosed is the detailed report (Volume 2) of the Railroad Accounting Principles Board. Both the summary report (Volume 1) and this report are issued by the Board to comply with the requirements of the Staggers Rail Act of 1980 (49 U.S.C. 11167).

Volume 2 is a detailed discussion of how the Railroad Accounting Principles apply to cost determinations made in regulatory proceedings before the Interstate Commerce Commission; it also elaborates on the factors considered by the Board in reaching its conclusions.

Although individual members preferred different approaches to certain issues, the Board is unanimous in its decision to publish both volumes of the report.

A handwritten signature in cursive script that reads "Charles A. Bowsher".

Charles A. Bowsher  
Chairman



# RAILROAD ACCOUNTING PRINCIPLES

FINAL REPORT

September 1, 1987  
Volume 2—Detailed Report



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RAILROAD ACCOUNTING PRINCIPLES BOARD



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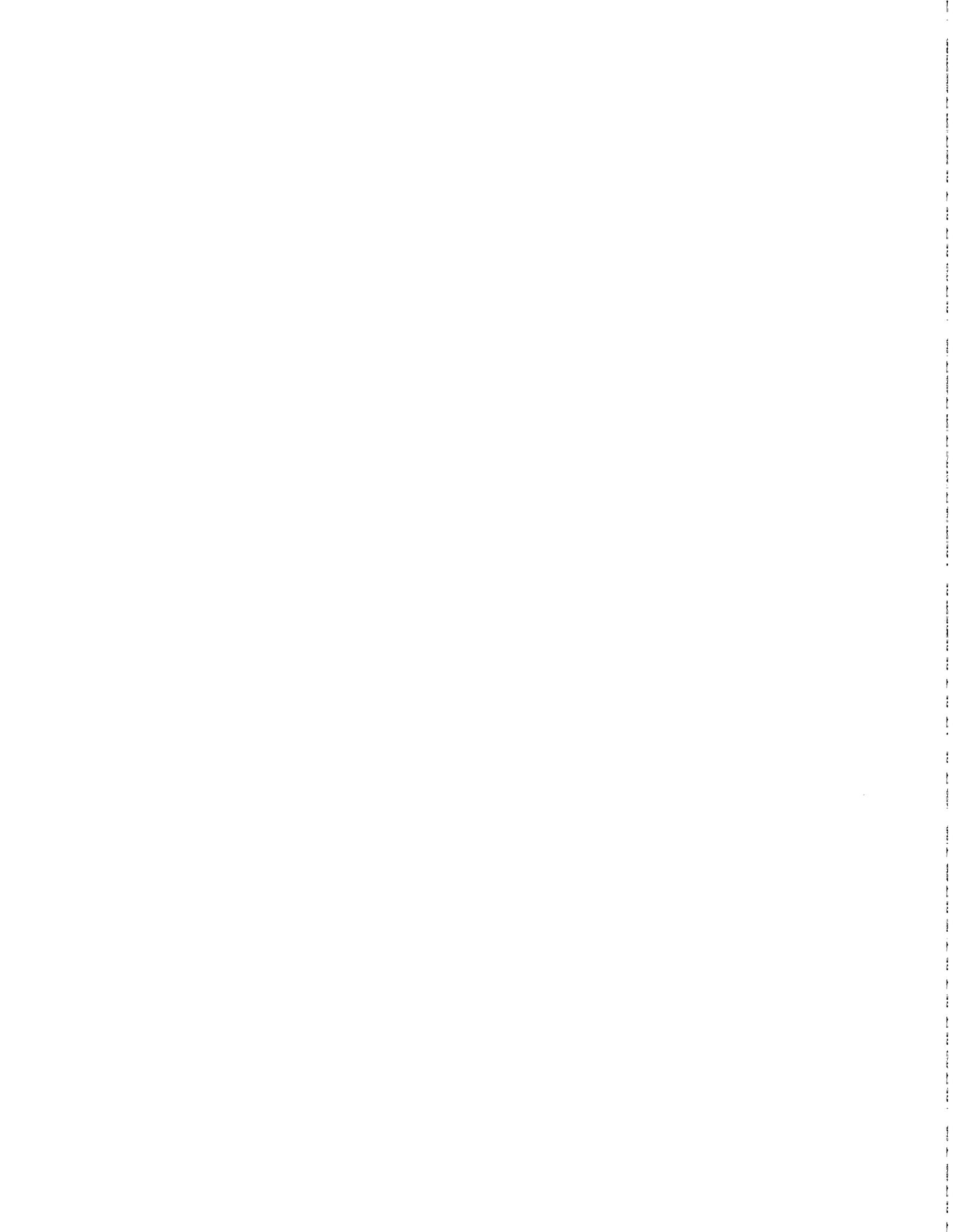
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# ABBREVIATIONS

|         |   |
|---------|---|
| AAR     | Association of American Railroads                         |
| AICPA   | American Institute of Certified Public Accountants        |
| APB     | Accounting Principles Board                               |
| ARB     | Accounting Research Bulletin                              |
| BLS     | Bureau of Labor Statistics                                |
| CAO     | Cost Analysis Organization                                |
| CMP     | constrained market pricing                                |
| DA      | depreciation accounting                                   |
| DCF     | discounted cash flow                                      |
| DVC     | directly variable cost                                    |
| FASB    | Financial Accounting Standards Board                      |
| GAAP    | generally accepted accounting principles                  |
| GAAS    | generally accepted auditing standards                     |
| GPCS    | general-purpose costing systems                           |
| ICA     | Interstate Commerce Act                                   |
| ICC     | Interstate Commerce Commission                            |
| M&O     | maintenance and operation                                 |
| MGTM/M  | million gross ton-miles per mile                          |
| NLV     | net liquidation value                                     |
| PCF     | presumptive cost floor                                    |
| R-1     | Railroad Annual Report Form R 1                           |
| RAPB    | Railroad Accounting Principles Board                      |
| RCAF    | Rail Cost Adjustment Factor                               |
| RFA     | Rail Form A   |
| ROI     | return on investment                                      |
| RRB     | retirement-replacement-betterment                         |
| SAC     | stand-alone costs   |
| SAS     | Statements on Auditing Standards                          |
| SEC     | Securities and Exchange Commission                        |
| SRA     | Staggers Rail Act of 1980                                 |
| USOA    | Uniform System of Accounts                                |
| URCS    | Uniform Rail Costing System                               |
| 4-R Act | Railroad Revitalization and Regulatory Reform Act of 1976 |



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# INTRODUCTION

In accordance with its congressional mandate, the Railroad Accounting Principles Board (RAPB) has established eight Railroad Accounting Principles to govern the determination of costs for specific regulatory purposes. The RAPB describes those Principles and their application in this document.

Volume 1, published separately, identifies the Principles, briefly discusses the regulatory circumstances in which those Principles will apply, and outlines the effects those Principles are intended to have on existing Interstate Commerce Commission (ICC) practices.

This volume, Volume 2, discusses these matters in greater detail. It explains the main alternative principles considered by the RAPB during its deliberations and the factors which contributed to the conclusions reached by the RAPB.

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## LEGISLATIVE BACKGROUND

The Railroad Revitalization and Regulatory Reform Act of 1976 (4-R Act) was enacted by the Congress to improve the financial viability of the nation's railroads. This legislation made a number of sweeping changes in the railroad regulatory environment and emphasized the need for the ICC to use more accurate accounting and cost data.

In response to this need, the ICC revised and expanded its prescribed regulatory accounting system, the Uniform System of Accounts (USOA), in 1978. The ICC also began a program to replace its existing Rail Form A (RFA) costing system with a more sophisticated Uniform Rail Costing System (URCS).

RFA and the URCS are accounting allocation systems that use statistical techniques to generate variable unit costs from annual expense and operating information reported to the ICC. RFA was originally developed in 1939 using the USOA developed in 1907. Its underlying statistical studies were last updated in 1972. The URCS, which has not yet been approved for regulatory costing purposes, has its roots in the revised and expanded USOA and in statistical studies completed in 1982. The URCS is designed to facilitate more frequent updating of the statistical studies.

The Staggers Rail Act of 1980 (SRA) further reduced the scope of rail regulation. It was intended to provide the railroad industry with additional incentives for ensuring the railroads' long-term viability while attempting to balance the needs of carriers, shippers, and the public where competition does not exist.

Certain important issues dealing with cost determination were left unresolved by the SRA. These issues long have been the basis for disagreement between shippers and the railroads.

The RAPB was created by the SRA in 1980 and was funded in 1984 (1) to establish a body of cost accounting principles to serve as the framework for implementing the regulatory provisions in which cost determination plays a vital role and (2) to make administrative and legislative recommendations it deems necessary to integrate the principles into the regulatory process.

According to the SRA, the ICC must implement and enforce the RAPB's principles through the rulemaking process, which will afford interested parties an opportunity to participate. Because the ICC is ultimately responsible for cost principles, it must review the principles in light of rulemaking comments from interested parties and reasonably explain the rules it adopts. However, as part of the rulemaking process, the ICC must accord substantial deference to the RAPB's principles and to the rationale underlying those principles.

During the past two and one-half years, the RAPB has considered various issues and proposed Principles, relying on staff research, consultants, ICC proceedings, and public comment. The RAPB published a notice in the February 20, 1985, *Federal Register* inviting the public to comment on the issues the RAPB should address. Subsequently, the RAPB published a notice in the January 31, 1986, *Federal Register* inviting the public to comment on and propose solutions to a series of issues and questions contained in an RAPB discussion memorandum. The RAPB published a notice in the February 20, 1987, *Federal Register* inviting public comment in written form on proposed Principles and recommendations contained in an RAPB exposure draft of this report. Finally, the RAPB held a public hearing on the proposed Principles on April 30, 1987, in Washington, D.C., at which interested parties appeared and presented oral statements.

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## **SPECIFIC REGULATORY APPLICATIONS**

The Railroad Accounting Principles provide a framework for determining railroad costs for specific regulatory applications. The Principles apply primarily to Class I railroads, their affiliated Class II and III railroads, and other railroad-related affiliates. If, however, the ICC requires that other Class II or III railroads provide cost information like that provided by Class I railroads for specific regulatory purposes, the Principles also would apply.

The Railroad Accounting Principles may not provide guidance for every regulatory determination that the ICC must address. For example, they do not address allocations of cost (or apportionments of burden) that depend only on regulatory policy objectives.

The SRA provides that the RAPB take into account the specific regulatory purposes for which railroad costs are required. During the

RAPB's deliberations, some commenters argued that the authorizing legislation did not grant the RAPB jurisdiction to provide for certain of the Principles' applications covered in this report. The RAPB has determined that the Principles and their applications as provided herein are fully within the scope of its statutory mandate. (Supporting opinions of counsel may be found at Volume 2, Appendix.) The specific regulatory applications addressed by the Railroad Accounting Principles are described below.

### **Revenue Adequacy**

The ICC is required to determine annually whether individual railroads generate revenues that are adequate to cover total operating expenses and the cost of capital. Railroads that are revenue adequate are subject to greater regulatory control than those that are not.

The regulatory standard adopted by the ICC to measure revenue adequacy is whether return on investment equals cost of capital. The RAPB has focused its efforts on the cost elements of the regulatory standard and not on the regulatory policy issue of the appropriate standard for determining revenue adequacy.

### **Maximum Rate**

Railroads may not charge a captive shipper a rate exceeding a reasonable maximum level. One of the factors the ICC presently considers in determining whether a rate is reasonable is its relationship to cost.

The ICC considers a rate for large movements of coal to be unreasonable if it exceeds the costs that a hypothetical new competitor would incur to provide the needed service to the captive shipper and other designated shippers. These costs are referred to as stand-alone costs (SAC). However, in maximum rate reasonableness proceedings on other than large movements of coal, the ICC has accepted cost evidence based on other methodologies and has proposed regulatory standards other than SAC.

The RAPB has focused its efforts on SAC without addressing whether it is the appropriate regulatory cost standard for maximum rate reasonableness cases.

### **Competitive Access**

The ICC may establish reasonable rates that one railroad may charge another railroad for providing switching services or for using its tracks. In addition to considering the cost to the railroad providing access, the ICC also considers other factors.

Joint rate/route cancellations are sometimes considered within the purview of competitive access. However, variable costs used in such cases are typically developed from general-purpose costing systems (GPCS), are subject to movement-specific adjustments, and do not require separate specific application consideration.

### **Abandonment/Surcharge**

A railroad may be allowed to abandon a branch line or add a surcharge to shipments to or from a branch line if the railroad is earning insufficient revenue from the line. According to the present ICC standard, branch-line revenues are sufficient if they equal or exceed (1) the cost that could be avoided by the railroad if it did not have to serve the branch line in question, including the opportunity cost associated with maintaining service, and (2) that portion of the railroad's nonbranch-line variable cost associated with the shipments originating or terminating on the branch line.

### **Minimum Rate/Long-Cannon Factors**

The ICC prohibits railroads from setting rates below a reasonable minimum level which the ICC has determined to be equal to directly variable cost. Also, the ICC is required to consider three factors, known as the Long-Cannon factors, in determining whether a rate exceeds a reasonable maximum level:

1. Traffic which does not contribute to going concern value.
2. Traffic on which revenues can be increased.
3. Traffic paying an unreasonable share of revenues.

The RAPB addressed only the ICC's minimum rate reasonableness requirement and the first Long-Cannon factor in terms of determining the minimum costs which must be recovered to contribute to the going concern value. Both of these determinations use the same costs. The two remaining Long-Cannon factors involve management pricing efficiency and cross-subsidy considerations where the role of cost is not clearly defined by current ICC policy. Consequently, subsequent references to "Minimum Rate/Long-Cannon Factor" pertain only to the first of the three Long Cannon factors.

### **Rail Cost Adjustment Factor**

Railroads are permitted to seek recovery of inflationary cost increases with minimal regulatory involvement by indexing tariff rates. They recover such costs using an index known as the Rail Cost Adjustment Factor (RCAF).

The RCAF is computed using a forecast index of industry-wide railroad input prices comprised of labor, fuel, materials and supplies, equipment rents, depreciation, and other expenses.

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## **GENERAL-PURPOSE COSTING SYSTEMS**

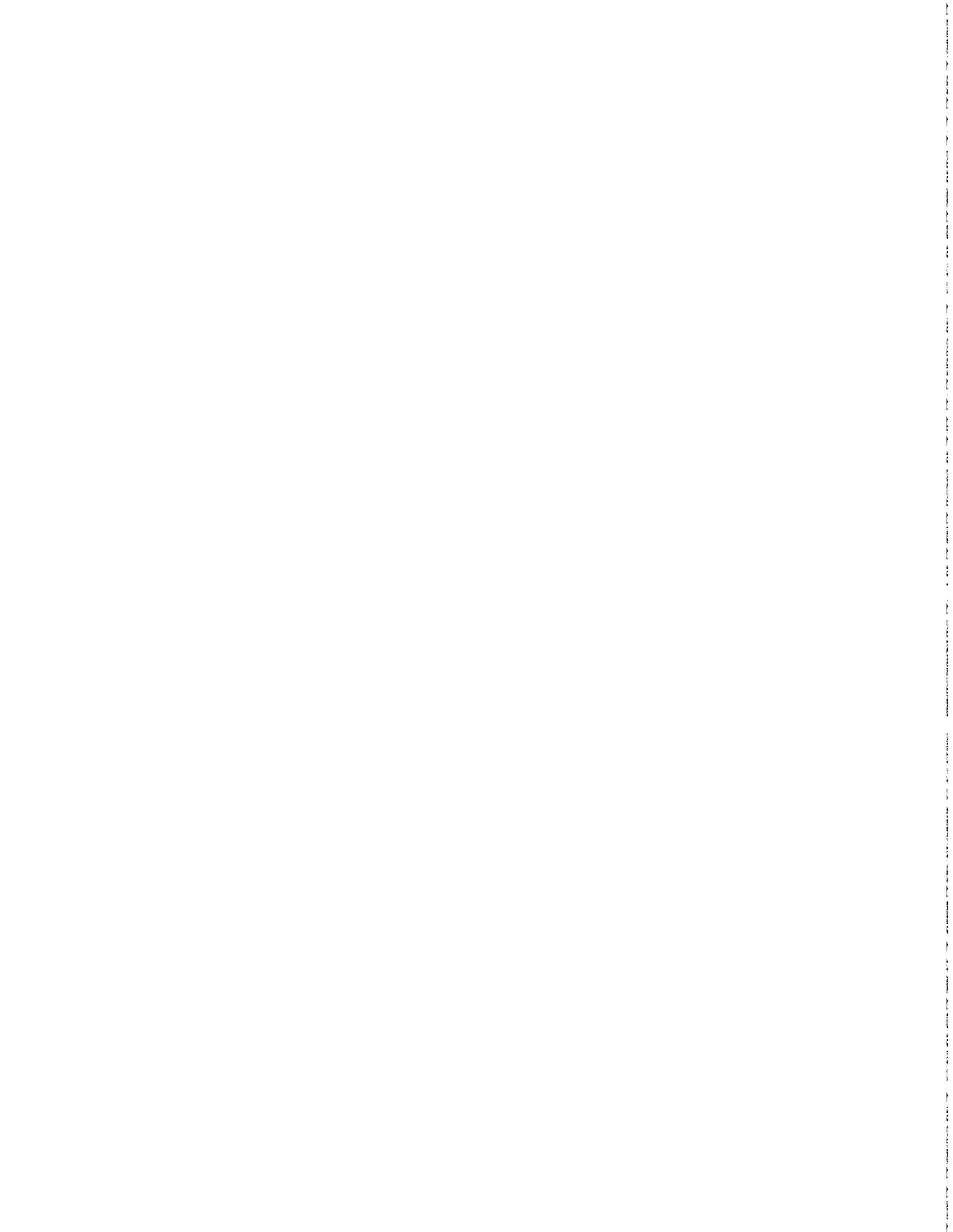
The ICC uses general-purpose costs as a regulatory device to estimate the variable costs that are used in certain specific regulatory applications. For example, the ICC has regulatory jurisdiction only over traffic whose tariff rates, compared on a percentage basis with the carrying railroad's variable cost for the traffic, exceed a statutory

threshold. The statute requires the use of GPCS to calculate variable costs.

GPCS may be used to estimate elements of movement costs in other proceedings, such as those involving maximum rate, competitive access, abandonment, and surcharge, when more detailed approaches are not cost-justified.

For GPCS, reported expenses are related to reported output by applying regression equations (such as those used in RFA and the URCS). Those expenses, in aggregate, reconcile to reported operating expense determined using generally accepted accounting principles (GAAP). However, a cost-of-capital amount is computed and included using an estimated variability.

The variable costs are then used to compute the variable unit costs of output. These variable unit costs are multiplied by the appropriate measures of output (called "service units") for the movements involved.



# **Railroad Accounting Principles**

This part of Volume 2 presents a detailed discussion of the eight Railroad Accounting Principles established by the RAPB. It presents the four general Principles and four specific Principles as follows:

**General Principles**

Chapter 1 - Causality

Chapter 2 - Homogeneity

Chapter 3 - Practicality

Chapter 4 - Data Integrity

**Specific Principles**

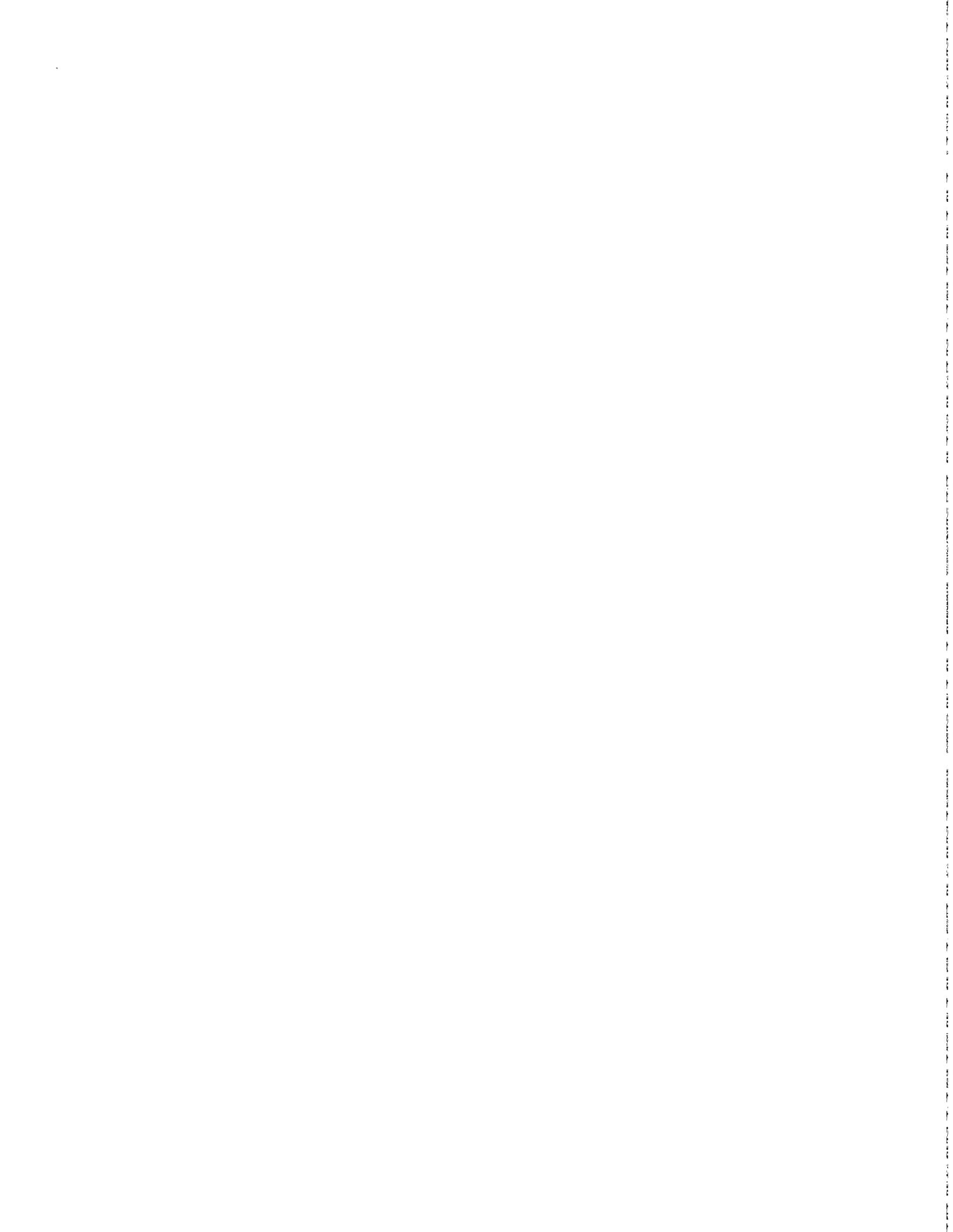
Chapter 5 - Entity

Chapter 6 - Cost of Capital

Chapter 7 - Asset Valuation and Related Expense

Chapter 8 - Productivity

Each chapter contains the established statement of principle as well as the rationale for its adoption. Several chapters present an analysis of alternative approaches considered by the RAPB during its deliberative process. They also identify the specific regulatory applications affected by each Principle.



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# CHAPTER 1

## Causality Principle

### STATEMENT OF PRINCIPLE

Costs shall only be attributed to cost objectives when a causal relationship exists (the cost would not have been incurred but for the requirements of the cost objective). A cost objective is the result of the use of resources. It can take many forms, depending on the purpose for which the cost information is needed.

Existence of a causal relationship may be established through direct observation, engineering analysis, and/or statistical techniques.

For each regulatory application, the costs must represent the time orientation relevant to the particular application. These time orientations may represent past or future, and short-run, intermediate-run, or long-run.

---

### EXPLANATION

Causality is the primary criterion for cost assignment. Cost is the amount (usually expressed in monetary terms) of input resources used to achieve a specified quantity of activity or service. Causality links cost with an activity or service.

The Causality Principle precludes, to the extent practical, the use of arbitrary cost assignment in determining economically accurate cost. It limits the use of costs to only those resulting from the activity which is the subject of the regulatory decision.

The Principle is based on the concept of avoidability as a test or determinant for causality. If the cost would not have been incurred but for the performance of the specified activity, then the cost is causally related to the activity.

The avoidability test is applied on an incremental basis. That is, the change in the level of an activity may result in a change in the level of costs incurred. Without the change in the level of the activity, the change in the level of costs would not have occurred. However, elimination of the activity may not result in total cost avoidance if joint and/or common costs are present.

The presence of joint and common costs requires the use of statistical techniques to establish cost variability. Estimates of cost variability are an integral part of GPCS.

The Causality Principle only includes costs which vary with the decision activity, and therefore it discourages apportionment or allocation of joint costs among activities where the relationship between the incurrence of cost and the joint performance of activities is inseparable among the activities.

Causality may be established through direct observation, engineering analysis, or statistical techniques. Direct observation involves specifically identifying and quantifying the incurrence of cost resulting from the performance of a specific activity.

Engineering analysis attempts to quantify physical relationships between input resources and output services in a production process. Engineering methods are used to estimate a specified mix of input resources (materials, labor, and plant and equipment capital) required to produce a desired quantity of output. Once these relationships are established, engineering analysis estimates total production costs by assigning unit prices to the physical input resources used. In some applications, engineering analysis may be required for only portions of a production process.

Statistical techniques are used to estimate cost variability by measuring the change in costs given a change in the level of the activity generating the cost. The statistical technique known as regression analysis is typically used in railroad costing applications to estimate cost variability from aggregated data. Variability estimates are used in GPCS such as the URCS and RFA.

The time orientation of costs is a critical component of the Causality Principle. In a particular cost application, the relevant activity or service may have occurred in the past, or it may occur in the future. Moreover, the activity or service may occur for a short time period, an intermediate time period, or a long time period.

Some regulatory applications of cost information require assessment of past performance; they pro-

vide feedback. Costs used in reparation determinations in maximum rate cases are an example of past costs.<sup>1</sup>

Other applications may require prediction of future performance using past information. For example, in a revenue adequacy determination, a railroad entity's return on investment (ROI, a measure of financial performance) reflects the past relationship of income to the entity's investment base.

However, when compared to a current cost-of-capital standard, ROI for a recent year may be viewed as a proxy for near-term future financial performance if the basic forces affecting railroads are not expected to change materially.

Still other applications require prediction of future performance using forecast information. For example, the relevant costs for a maximum rate reasonableness case are those costs that a hypothetical new competitor would incur in providing the services associated with the contested rate.

The difference between historical costs and future costs depends on changes affecting cost-output relationships from the period reflected in the historical costs to the future period. For example, the rates of inflation, technological changes, and productivity changes expected in various movement cost components are factors which cause future costs to depart from historical costs.

The other time-period aspect of causality is the length of time pertinent to an activity or service affected by a decision. The short-run, intermediate-run, and long-run time distinctions are common in managerial accounting and economics. In the short run, production capacity is constrained by existing plant and equipment. Thus, short-run costs are limited to those costs associated with a change in the level of activity of a cost objective within existing capacity limits. Intermediate-run costs include costs associated with a change in the firm-wide level of output requiring a change in plant size or equipment capacity, a change in the production process, or a change in the output service mix. Long-run costs include all costs associated with changes in production capacity. In the long run, capital costs related to plant and equipment are entirely variable.

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<sup>1</sup>Reparations are refunds of past charges in excess of a maximum reasonable rate.

The importance of recognizing the length of time pertinent to a regulatory decision is illustrated by the determination of minimum rate costs. Generally, as the length of the time period for analysis increases, more capacity-related capital costs become relevant since excess capacity can be liquidated or constrained capacity can be expanded. Consequently, a short-run movement designed to take advantage of excess capacity may incur little, if any, additional capital costs. However, a longer-term movement may require additional capital costs, or it may incur an opportunity cost by requiring a commitment of resources which could be used to handle other traffic.

Three criteria should be used to establish variability relationships through regression analysis: (1) logical explanation of a causal relationship between expense and output, (2) results that are statistically

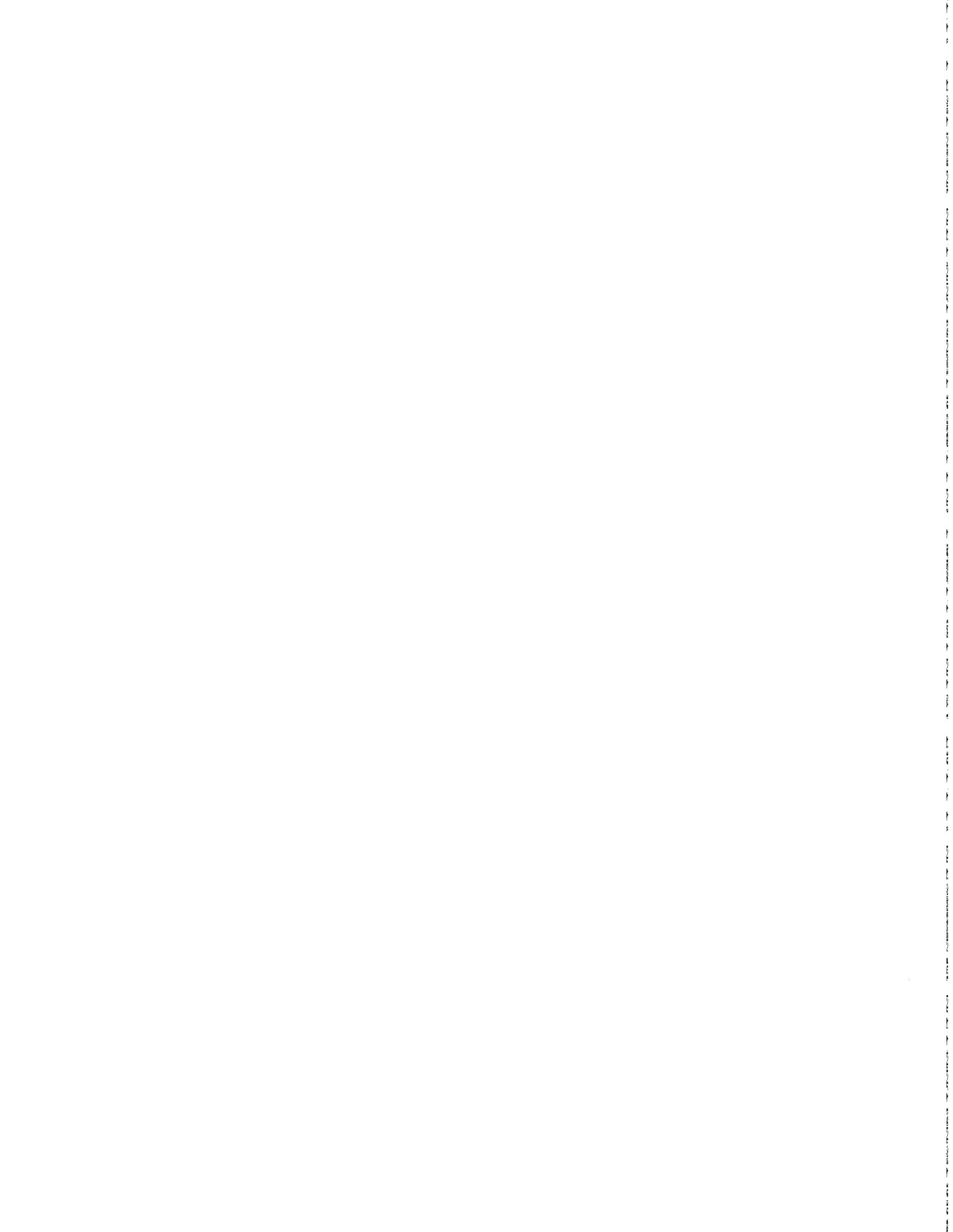
significant, and (3) judgment and experience in interpreting the results of the analysis.

## **ALTERNATIVES**

No alternatives to the general concept of using causality as the criterion for cost assignment were proposed. However, different regression analysis approaches for establishing GPCS cost variability were proposed. These alternative approaches are addressed in Chapter 17, page 103.

## **APPLICATIONS AFFECTED**

The Causality Principle affects all of the specific regulatory applications addressed by the RAPB with the exception of the RCAF.



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# CHAPTER 2

## Homogeneity Principle

### STATEMENT OF PRINCIPLE

Cost information shall be organized into homogeneous cost pools. A homogeneous cost pool is a group of costs which are governed by essentially the same set of determinants and which respond to changes in output in essentially an identical manner.

Some homogeneous cost pools may consist of costs of interchangeable resources. Resources are considered interchangeable if they can be substituted for one another without loss of efficiency. In any such case, the costs of resources shall be assigned to cost objectives on the basis of the average cost of the interchangeable resource.

---

### EXPLANATION

When a group of costs are assigned to cost objectives (such as movements of goods) by means of measures of output, both the costs so assigned and the measures of output must be homogeneous.

A group of homogeneous costs is known as a homogeneous cost pool. The similarity that must exist among costs in a homogeneous cost pool lies in the causal relationship between the individual costs and output; all costs must have the same causal relationship to the measures of output that will be used to assign the pool to cost objectives.

Maintenance-of-way expense, such as the Running subactivity under the Way and Structures activity

in the USOA, is an example of a cost pool often believed to be homogeneous. It is collected at a system-wide level. Some have argued that such a large pool is heterogeneous; it should be broken up by density category or by geographic area to achieve homogeneity. The RAPB has not adopted this position for practicality reasons. (See discussion of cost centers, pp. 14 and 15.)

The application of the Homogeneity Principle to the costs in a pool can best be explained by applying the Principle to general-purpose costing. In general-purpose costing, homogeneity is achieved in two steps.

First, costs of similar resources are collected in cost pools required by the USOA. The highest level of

aggregation in the USOA comprises "activities" which are broken down into subactivities, and in turn broken down into functions.

Second, expenses which have been broken down in accordance with the USOA are aggregated into relatively few cost pools, known as account groups, required by the URCS. These account groups are used as dependent variables and analyzed using regression analysis which incorporates particular measures of output. Sixteen such account groups are used in the URCS.

While the Homogeneity Principle governs the establishment of the account groups, it governs none of the URCS functions performed after that. The remaining functions are (1) segregation of variable costs from fixed costs, (2) assignment of variable costs to output measures (e.g., switching minutes and train miles), and (3) assignment of variable costs to cost objectives. The first two are governed by the Causality Principle; the third is merely a mechanical process.

Interchangeability is a subset of the Homogeneity Principle. It represents the maximum degree of homogeneity attainable.

Interchangeability is a characteristic of two or more resources that are interchangeable with one another, such as gallons of fuel, wages paid to employees performing particular functions (conductors, for example), and locomotives of the same model and age.

The costs of interchangeable resources should be charged at their average rate. Costs of specific resources (one locomotive out of a group of interchangeable locomotives, for example) should not be identified with the particular cost objectives to which they are applied (a particular movement of goods, for example).

Interchangeability minimizes chance variations which affect measures of cost. As an example, if it is only chance that determines that one conductor instead of another was used on a particular train, differences in pay between the two should not affect the measure of cost.

The elimination of chance variability (that is, the application of the interchangeability aspect of the Homogeneity Principle) lies behind much of the normalizing procedures that are used in GPCS such

as the URCS. For example, averaging the expenses of several years reduces the effect of chance variations among years.

Interchangeability must be applied with care. Even though all locomotives of the same specification may seem interchangeable, for example, a closer look may establish that the newer locomotives of that specification are used primarily on through trains to reduce the probability of breakdowns, while the older locomotives of that specification are primarily reserved for way trains. In such a case, the locomotives, in theory, should be charged individually to the two types of service, as should the cost of breakdowns. The locomotives are not interchangeable.

The Homogeneity Principle is closely aligned with the Practicality Principle. In considering whether to require additional cost pools, the benefits likely to be derived from that information must be weighed against the cost of collecting and reporting it. For example, recording fuel expenses by locomotive type (number of axles, horsepower, and age) would capture important factors influencing fuel use. But this benefit could only be achieved by paying a high price in the form of extensive record keeping.

## ALTERNATIVES

The RAPB considered cost-center accounting to increase the homogeneity of reported costs. It was able to follow and benefit from the work of the ICC, which studied cost-center accounting in Docket No. 37203, decided October 26, 1979.

Cost centers are cost pools that accumulate costs at a level below that of subactivities. For example, geographic and density cost centers are possible alternative breakdowns of maintenance-of-way expenses. Geographic cost centers would group these expenses by geographic area.

Density cost centers would group these expenses into traffic density categories on the basis of million gross ton-miles per mile (MGTM/M). An example follows:

- 20 - MGTM/M or above.
- 5 - 20 MGTM/M.
- 0 - 5 MGTM/M.
- Track subject to abandonment.

Both geographic and density cost centers capture density relationships, the primary causal factor of maintenance-of-way expenses.

Geographic cost centers may also be helpful in identifying other causal factors, such as work methods, track condition, terrain, climate, and type of train service. The ability of these cost centers to isolate causal factors could be improved, depending on the level of disaggregation chosen: operating division, roadmaster territory, or line segment. Theoretically, at each successive lower level of disaggregation, the cost centers could identify more causal factors.

Density cost centers would, of course, capture only the causal factor of density. Such cost centers would, however, be less costly to install and maintain.

## **ANALYSIS OF ALTERNATIVES**

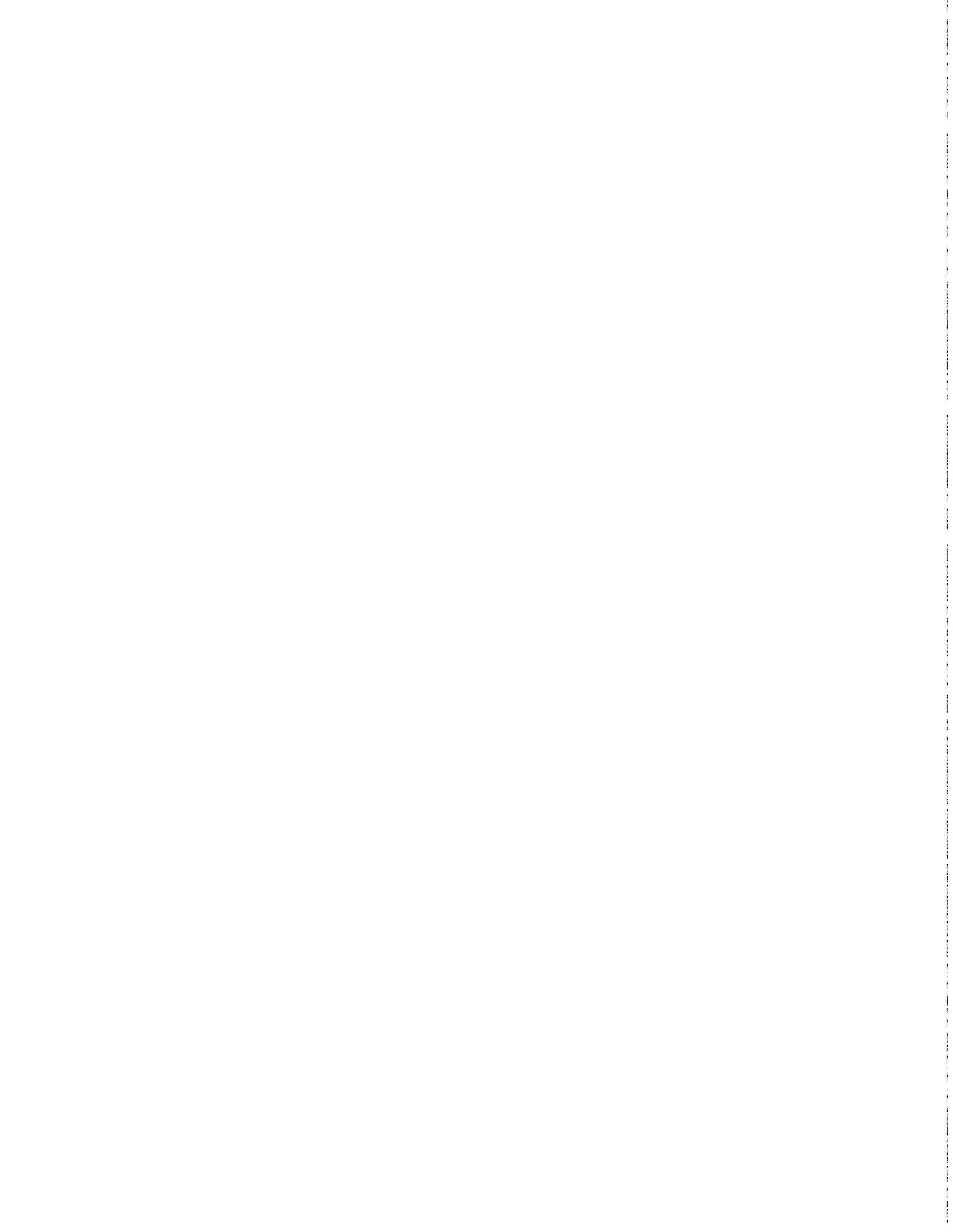
The RAPB concluded that the record-keeping cost of either form of cost-center accounting would probably outweigh the benefits that would be realized. This conclusion results from the limited use of GPCS (such as the URCS), which would be the primary beneficiary of cost-center accounting.

GPCS have limited usefulness for three reasons: (1) the limited amount of traffic subject to regulation (approximately 20 percent), (2) the frequency with which special studies are used, and (3) the use of SAC in maximum rate cases. By their very nature, GPCS will always be forced to rely on averages and, therefore, never be able to attain the degree of accuracy attained by special studies.

Additional discussion of cost-center accounting is provided in Chapter 18, p. 111.

## **APPLICATIONS AFFECTED**

The Homogeneity Principle is mainly applied to GPCS such as the URCS. It also applies to any applications in which cost pools are established for subsequent assignment to cost objectives. For example, in abandonments, the Homogeneity Principle applies to off-branch costs, the costs of moving traffic that originates or terminates on the branch line over main lines. Such costs are assigned to the branch line on the assumption that the costs of main-line traffic are homogeneous.



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# CHAPTER 3

## Practicality Principle

### STATEMENT OF PRINCIPLE

Cost and related information should be feasible to obtain, efficiently determined, and material in amount. To be feasible, information must be physically possible to obtain at an acceptable level of accuracy. To be efficiently determined, information must generate benefits that exceed the costs of providing it. To be material in amount, information must have such a bearing on the issue at hand that its absence would lead to a significantly different outcome.

---

### EXPLANATION

According to 49 U.S.C. 11162(b)(3) and (4), the RAPB, in developing cost accounting principles, is to take into account:

- “The existing capability and the probable future capability of rail carriers to provide . . . information and the relative benefits and costs of requiring development of additional capability.
- “The means by which the degree of economic accuracy required can be obtained at the least possible expense and with the least possible information reporting.”

The Practicality Principle reflects these provisions of the SRA and combines the attributes of feasibility, efficiency, and materiality.

### Feasibility

Feasibility relates to the ability to prepare cost information reliably and accurately.

Unless collecting, recording, or computing data is physically possible, then obtaining that information is not feasible, regardless of the contribution it theoretically could make to the costing process.

The real cost of capital may be used as an example. It is the stable return that investors require in addition to being compensated for inflation. The real cost of capital is not observable in the financial markets; it must be estimated by removing investors' expected price level changes from the nominal (observed) rates.

Although numerous methods for estimating the real cost of capital have been proposed, none appear to

provide sufficiently reliable results (see Ch. 6, p. 36). Thus, the calculation of an accurate, stable real cost of capital appears infeasible.

## Efficiency

According to the Practicality Principle, to justify requiring particular cost information, the benefits to be derived from the cost information must exceed the costs of providing it. The Practicality Principle provides limited flexibility in applying the Railroad Accounting Principles so that a less expensive method may be used to estimate costs when the results are not significantly different from those that would have been achieved through strict conformance with the Principles.

The Financial Accounting Standards Board (FASB), in *Statement of Financial Accounting Concepts No. 2*, noted that the costs of providing information included

- collecting and processing,
- auditing,
- disseminating,
- potentially litigating,
- possibly disclosing, and
- analyzing and interpreting.

Collecting and processing costs include the increases or decreases in cost associated with information used on a regular basis, as well as any initial designing and programming necessary to facilitate a change. Auditing fees are based on the scope of procedures to be performed. Disseminating the information is a necessary step to providing the required information. Litigation may result over information presented. Disclosure may result in costs incurred by the reporting firm in one of three ways: through the loss of business to competing firms (railroad, truck, or barge) which may use this information to compete for customers, through reduction in revenue due to customers' use of the information to negotiate more effectively, and through the ability of a competitor to identify and copy innovations that would improve his operations. (Of course, from the perspective of those using the reported data, these items are benefits.) Analysis and interpretation may include costs of rejecting redundant information and, of course, the time spent analyzing and interpreting the information.

Although some of these costs may be less difficult to measure than the benefits associated with the cost information, both are difficult to quantify. Precision is not easily achieved. A cost-benefit analysis technique may be useful, but judgment may be the ultimate decision factor.

Also, the purchase of cost and related information is different from the purchase of other commodities in certain respects. While most other commodities may be enjoyed only by the buyer or with others at the buyer's discretion, the benefits of cost information are not confined to those who have paid for it. Although the initial expense may fall on the preparer, ultimately costs and benefits are widely diffused. So questions of judgment arise, such as how the costs and benefits are to be measured and imputed, and how much of the information would be compiled for the preparer's own use, apart from regulatory requirements.

Two commenters suggested that the ICC be required to justify all existing regulatory schedules as well as data elements within the schedules. This process, they assert, should demonstrate the relevancy of the required data, how it is used, and how often it is needed. While the RAPB believes that the Practicality Principle applies to both existing and new reporting requirements, addressing such detailed implementation issues is better left for the rule-making process the ICC will conduct to implement the Principles.

## Materiality

Several aspects should be considered when determining what is material. Generally, the nature of the item, the circumstances, and the magnitude should be studied. However, a standard of materiality which accounts for all considerations entering into experienced human judgment is not likely to be formulated. An observation on materiality from an article by Carman G. Blough in *The Virginia Accountant* in 1949 is still appropriate:

"The question of what is material has puzzled a great many people over a great many years, yet nobody is prepared to define it so that it does not ultimately rest on someone's judgment."

The FASB, in *Statement of Financial Accounting Concepts No. 2*, uses an example of a job applicant at an employment agency to illustrate materiality.

The duties, location, salary, hours of work, and fringe benefits would be information the applicant will certainly want. However, job security or vacation information may or may not be of sufficient importance to affect a decision about the job. Perhaps quality of cafeteria food or carpeting on the office floor may be of no concern to the applicant.

An accounting illustration taken from *Intermediate Accounting* by Kieso and Weygandt shows the significance of relative size and importance versus absolute size in making materiality judgments.

#### ILLUSTRATION OF MATERIALITY

|                        | <u>Company A</u>    | <u>Company B</u> |
|------------------------|---------------------|------------------|
| Sales                  | \$10,000,000        | \$100,000        |
| Costs and expenses     | <u>9,000,000</u>    | <u>90,000</u>    |
| Income from operations | <u>\$ 1,000,000</u> | <u>\$ 10,000</u> |
| Unusual gain           | \$ 20,000           | \$ 5,000         |

During a similar time period, both companies have proportional revenues, expenses, and net income. Each shows an unusual gain: Company A's unusual gain is \$20,000; Company B's unusual gain is only \$5,000. Yet, relatively, Company A's unusual gain is much less significant than Company B's unusual gain because it is a much smaller percentage of the company's net income. Obviously, disclosure of the gain is material.

The following factors should be considered in determining materiality:

- The cumulative effect of errors that are, in themselves, immaterial should be considered. For example, in the computation of cost of capital for revenue-adequacy purposes, the cost of preferred stock could be immaterial for a given railroad in the sample but material for all of the railroads in the sample. In such a case, omission of the cost of preferred stock would constitute a material error.

- Circumstances should make a difference in determining what is material. Suppose the computation of a railroad's ROI, to be used for revenue-adequacy purposes, contains an error of one-half of one percent. The error might be immaterial if the ROI would in any case be far below the cost of capital determined by the ICC. The error probably would be material, however, if its correction would make the railroad revenue adequate.
- The degree of precision that is attainable should be considered. For example, less precision for materiality requirements should apply to computations of the cost of equity rather than to computations of the ROI. ROI can be accurately computed from reported financial information. The cost of equity, on the other hand, is not observable and can only be inferred from available financial information. Since less precision is attainable for the cost of equity computation, this fact should influence materiality judgments.

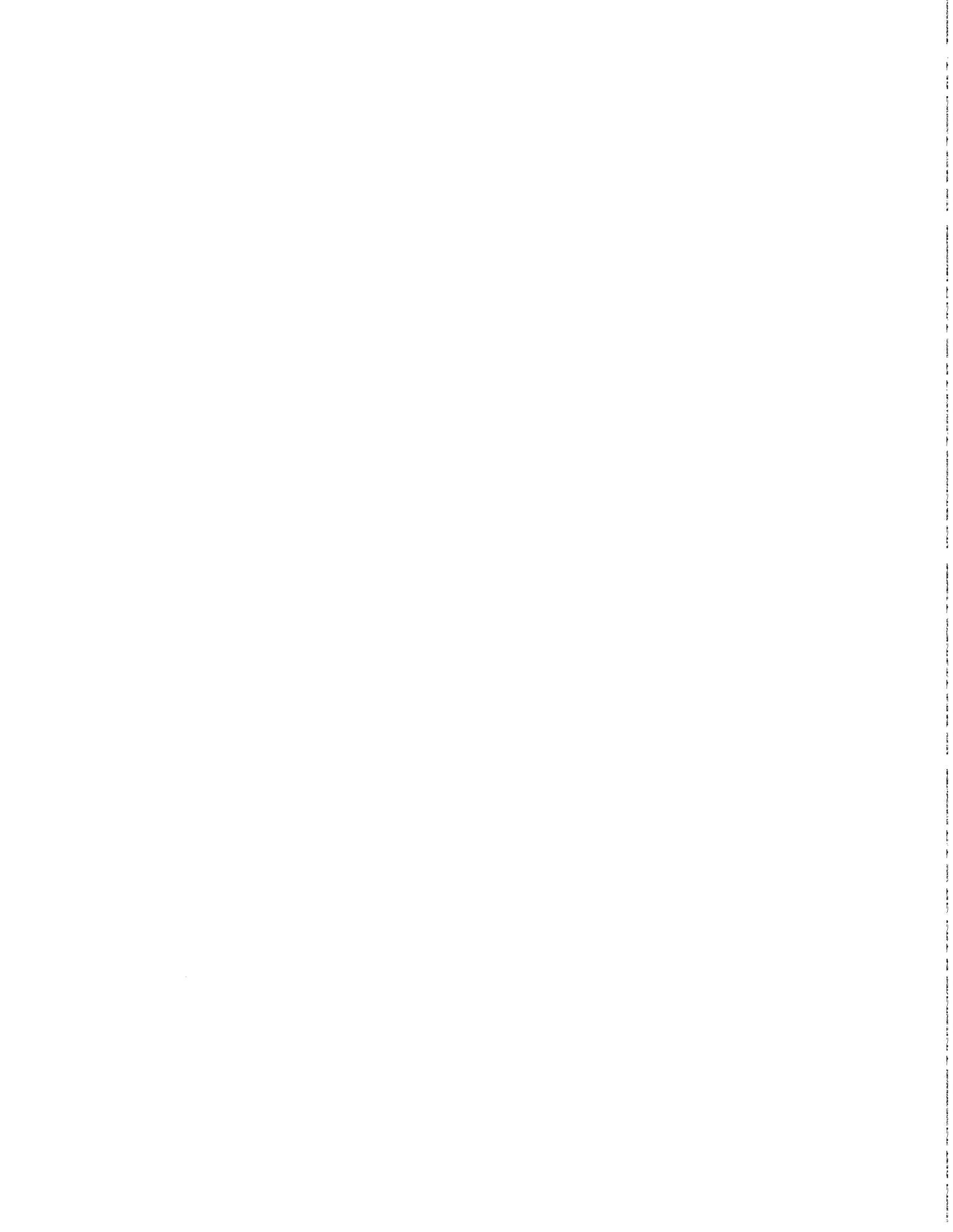
## **ALTERNATIVES**

The Practicality Principle underlies all accounting systems and is pervasive in nature. Because of its significance and far-reaching influence, the Practicality Principle is a fundamental tool in developing economically accurate costs.

The RAPB determined that a Practicality Principle was necessary for the reasons stated above to address the requirements of 49 U.S.C. 11162 (b)(3) and (4). The RAPB did not receive from commenters any alternative principles for its consideration.

## **APPLICATIONS AFFECTED**

The Practicality Principle affects all of the specific regulatory applications addressed by the RAPB.



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# CHAPTER 4

## Data Integrity Principle

### STATEMENT OF PRINCIPLE

Cost and related information should be valid, accurate, and verifiable. To be valid, information must represent what it purports to represent. To be accurate, information must be free from significant error and conform to applicable standards. To be verifiable, historical cost information must be supported by underlying source records; judgmental information must include the factors supporting the judgment.

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### EXPLANATION

The Data Integrity Principle applies to cost and related information used for all regulatory purposes. It is intended to cover material submitted by railroads, shippers, the ICC, and others as part of regulatory proceedings. Thus, it offers all parties a sufficient basis to evaluate and rely upon cost and related information used.

Validity, accuracy, and verifiability are significant attributes of cost and related information. These and other qualitative characteristics have been emphasized by the FASB in its *Statement of Financial Accounting Concepts No. 2*.

According to the FASB, validity, referred to as representational faithfulness, and verifiability are the two primary ingredients of reliability. Information reliability is considered a primary decision-specific quality.

The *Statement of Financial Accounting Concepts No. 2* defines validity as:

“correspondence or agreement between a measure or description and the phenomenon that it purports to represent.”

It defines verifiability as:

“the ability through consensus among measurers to ensure that information represents what it purports to represent or that the chosen method of measurement has been used without error or bias.”

The American Accounting Association, in *A Statement of Basic Accounting Theory*, defines verifiability as:

“... that attribute of information which allows qualified individuals working independently of

one another to develop essentially similar measures or conclusions from an examination of the same evidence, data or records.”

The FASB notes that usefulness of accounting information is increased through the quality of verifiability.

Reliability of accounting information, then, stems from the two characteristics of validity and verifiability. To illustrate its meaning, the FASB applies the definition of reliability to a bottle of medicine. Reliability implies that what is represented on the label corresponds to the contents of the bottle, not that the drug will be effective in curing the condition for which it was purchased. Further, reliability is measured in degrees. It is not a question of presence or absence but rather one of more or less.

In 49 U.S.C. 11162(b)(2), the RAPB is to consider “the degree of accuracy of the cost information which is needed to meet regulatory purposes.” Accuracy implies correctness. The degree of accuracy is measured by its conformity to a true value or a standard. When determining conformity to a standard, numerous standards, such as ICC regulations, may apply.

The two types of information—reported information and special study information—that the ICC uses in cost determinations for specific regulatory purposes may require different degrees of verification. Reported information is subject to more strict audit procedures than special study information. Reported information typically possesses data integrity because it may be reconciled to other publicly available data, such as annual reports to shareholders.

The ICC recently determined in Ex Parte No. 460, *Certification of Railroad Annual Report R-1 by Independent Accountant*, that certain railroad-reported information be examined by independent public accountants and that the information be provided to the ICC for review. Before Ex Parte No. 460, ICC staff performed this audit function. In this decision, the ICC:

“... will require Class I railroads to submit a report from an independent public accountant stating that specified data in the R-1 annual report have been examined, using agreed-upon procedures, and found in compliance with the Uniform System of Accounts for Railroad Com-

panies. The report would also present any material exceptions which came to the attention of the accountant during the examination. This revision will provide an alternative to the audits currently being performed by the Commission Staff.”

Some commenters suggested that an independent audit of financial information may be insufficient for assuring accuracy for regulatory purposes. While an audit may not assure 100-percent accuracy, the ICC should have agreed-upon procedures to provide the necessary level of assurance. Since the ICC must ensure the integrity of data used for regulatory purposes, it should be responsible for designing such procedures.

Similarly, some commenters requested that the RAPB make a statement regarding the varying needs for data integrity in regulatory reports. The RAPB agrees that the procedures necessary to verify regulatory information require consideration of materiality and efficiency as discussed in the Practicality Principle. Materiality and efficiency require assessment of the effort to be expended in relation to the significance of the data. Therefore, in developing agreed-upon procedures for reported information, the ICC must ensure adherence to the Practicality and Data Integrity Principles.

Special study information typically consists of the cost (either actual, historical, or estimated) of operating only a portion of rail service or factors and adjustments used with GPCS. Special study information used in ICC proceedings may include data not publicly reported or audited. The adversaries in each proceeding present their own cost evidence and attempt to demonstrate the superiority of that evidence through discovery and rebuttal.

## ALTERNATIVES

In considering implementation of the Data Integrity Principle, the RAPB considered the following alternatives:

- Application of agreed-upon procedures to reported information by independent accountants and the ICC. The independent accountants shall comply with the Statements on Auditing Standards (SAS) No. 35 and the American Institute of Certified Public Accountants (AICPA) *Statement on Standards for Attestation Engagements* (and/or their

successor pronouncements). For special study information, analysis of data shall be by the parties involved in the proceedings.

- Examination of reported information by the ICC. For special study information, analysis of data shall be by the parties involved in the proceedings.
- Examination of reported information by independent accountants. Required submission of a positive assurance report in conformity with generally accepted auditing standards (GAAS) and/or AICPA attestation standards. For special study information, analysis of data shall be by parties involved in the proceedings.
- Examination of reported information with a similar degree of verification applied to special study information.

## ANALYSIS OF ALTERNATIVES

The RAPB determined that either of the first two alternatives is acceptable. The RAPB chose these alternatives for three primary reasons:

- Audit by either the ICC or by the ICC and independent accountants helps ensure data accuracy.
- Accepted standards of quality are necessary.
- The approach has been effectively used in other cases.

The ICC performed the audit function for reported information before Ex Parte No. 460. The RAPB finds no theoretical rationale for preferring one set of auditors over another to perform the work. The RAPB believes the choice is an administrative one for the ICC and, therefore, will not address the issue.

Audit verification, on the other hand, helps ensure the accuracy and validity of reported information. If independent accountants are used, they will examine selected data from the Railroad Annual Report Form R-1 (R-1) and submit a report to the ICC. Subsequently, the ICC audit group will review the working papers and the report draft. Therefore, two different, knowledgeable, and independent bodies—the public accountants and the ICC audit staff—will participate in the verification process.

Otherwise, the ICC audit staff would handle the entire verification process.

Auditors should be subject to accepted standards of quality in their performance and reporting. They should comply with SAS No. 35, *Special Reports—Applying Agreed-Upon Procedures to Specified Elements, Accounts, or Items of a Financial Statement* (and/or its successor pronouncements), required by the ICC in Ex Parte No. 460. SAS No. 35 applies to audit responsibility for specified elements, accounts, or items of a financial statement. It requires independent accountants to comply with four of the ten GAAS:

- Adequate technical training.
- Independent mental attitude.
- Due professional care.
- Adequate planning and supervision.

For other reported information not covered by SAS No. 35, the RAPB recommends that independent accountants comply with the AICPA *Statement on Standards for Attestation Engagements*. These attestation standards were issued by the Auditing Standards Board and the Accounting and Review Services Committee under the authority of the AICPA in March 1986, subsequent to the ICC Ex Parte No. 460 decision. The attestation standards include the four GAAS standards mentioned above in addition to seven others in three categories (general, field work, and reporting).

Another reason for concurring with these alternatives is that, in the past, other government regulatory agencies have found the services of independent public accountants effective in contributing to the data verification process. For example, the Federal Energy Regulatory Commission (and its predecessor, the Federal Power Commission) has been using independent accountants since 1970.

As for special study information, the RAPB's recommended alternative is to provide the parties with an opportunity to present evidence, demonstrate its credibility, and challenge contradictory evidence. Information for any regulatory proceeding is presented by the parties in each proceeding. Due to the highly individualized data requirements for each proceeding, the parties appear to be in the best position to demonstrate the credibility of their

evidence and challenge contradictory evidence. Moreover, testimony under oath is required in these proceedings. Special study information may also be measured against guidelines and quantitative results accepted from previous proceedings.

In any case, documentation must be sufficiently complete to permit evaluation of the data. The RAPB received comments from the AICPA suggesting general guidelines for verifying special study information. The RAPB recommends that the following AICPA guidelines be adopted:

- “Required disclosure of all key assumptions, methodologies, and allocations used and the rationale or support for them.
- “Required explanations of the relevancy of the data to, and assumptions used in, the issues involved in the proceeding.
- “Identification of the data sources used.”

#### **Alternatives Not Chosen**

A requirement for independent accountants to submit a positive assurance report to the ICC for reported

information was not endorsed because it conflicts with the Practicality Principle. Such a report would substantially increase the scope of the audit, placing a heavier financial burden on the railroad industry. Additionally, the audit would include certain schedules, such as those involving railroad operating statistics, that do not lend themselves to positive assurance reports.

To apply the same verification process to special study information as required for reported information would also violate the Practicality Principle. It would be expensive, time-consuming, and in many cases not relevant due to the diverse nature of the financial evidence required for the various proceedings. This diverse information does not easily conform to the more formalized procedures required for reported information.

#### **APPLICATIONS AFFECTED**

The Data Integrity Principle involves all applications. For revenue adequacy and GPCS, the recommendations for reported information would apply. For all applications, the recommendation for special study information would be relevant.

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# CHAPTER 5

## Entity Principle

### STATEMENT OF PRINCIPLE

The railroad entity shall comprise the activities of affiliated railroads and their railroad-related affiliates. Affiliation is defined in conformance with generally accepted accounting principles.

The railroad entity shall measure and report information about railroad-related activities in conformance with generally accepted accounting principles, unless otherwise provided by specific Railroad Accounting Principles. Railroad-related activities are those provided in support of railroad operations. When nonrailroad-related activities are included in the entity, they shall be segregated and the information reported separately.

Any railroad-related transaction between the railroad entity and others (including affiliates that are not railroad-related), or any reclassification between railroad-related and nonrailroad-related status within the entity, shall be recorded at the fair market value at the time of the transaction or reclassification. Gain or loss shall be recognized at the same time.

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### EXPLANATION

The Entity Principle defines the activities to which the Railroad Accounting Principles apply and broadly describes the requirements for reporting. As one objective, it is designed to treat comparable railroad entities in a comparable manner. Thus, if the underlying railroad activities of two railroad enterprises are comparable, the Entity Principle ensures that those enterprises will have comparable entities,

regardless of the numerous organizational or legal corporate forms they may take.

The entity includes subsidiaries and other affiliated parties that directly or indirectly (through one or more intermediaries) control, are controlled by, or are under common control with the affiliated railroads. The RAPB has adopted the GAAP definition of control as identified in FASB Statement No. 57, *Related Party Disclosures*:

"The possession, direct or indirect, of the power to direct or cause the direction of the management and policies of an enterprise through ownership, by contract, or otherwise."

Unless otherwise specified by Railroad Accounting Principles, the entity shall rely on GAAP to help ensure both consistency and accuracy in accounting.

Because the focus of regulation is railroad-related activity, the railroad entity needs to measure and report information about railroad-related activities. These activities are not limited to direct railroad operations, such as track laying or locomotive and car repair. They can include generic support operations, such as computer services or sales and marketing services.

Some nonrailroad-related activities may be included in the entity for data integrity reasons. When the railroad entity includes nonrailroad-related activities, those activities generally must be segregated and reported separately.

In segregating railroad-related information from nonrailroad-related information, the Practicality Principle applies. To the extent that the segregation of railroad-related activities of affiliates is impractical, the Practicality Principle permits either the inclusion or exclusion of the entire affiliate on the basis of whether or not the affiliate is predominantly railroad-related. If predominantly railroad-related, the entire affiliate is reported as railroad-related (operating); if not, the entire activity is excluded. An affiliate is predominantly railroad-related if it could not continue to exist but for the revenue derived from or the support provided for railroad operations.

The requirements of revenue adequacy were a principal consideration in establishing the Entity Principle. The ROI criterion used for revenue adequacy determination most closely conforms with the railroad enterprise, requiring assets, deferred tax liability, revenues, and expenses to be reported for the railroad-related activities of the entity as a whole.

This reporting requirement can be met with the submission (filing) of a condensed, combined balance sheet and condensed statement of operations. Additional detailed statistics and other information included in the R-1 are not necessary for revenue adequacy determination.

While the Entity Principle specifically describes the railroad enterprise as a whole, other Railroad Accounting Principles may require smaller entities for specific regulatory applications. For example, in competitive access, the Causality and Homogeneity Principles may require the use of components or parts of the entity.

If individual R-1 reporting is continued for GPCS, the Entity and Data Integrity Principles indicate that the individual reports of all railroad companies included in an entity should reconcile to the amounts that would be reported for the railroad entity as a whole. Reconciliation recognizes that the railroad entity consists of a combination of railroad-related affiliates, not all of which may report to the ICC or report all R-1 schedules. Therefore, while the numbers may not add to the total, they are traceable to the statements of the affiliates included.

The three components of the Entity Principle are presented and analyzed separately. They are (1) determining the railroad entity, (2) requiring use of GAAP, and (3) requiring use of fair market value to record transactions between the railroad entity and others.

## ALTERNATIVES

In establishing its Entity Principle, the RAPB adopted a broad definition of the railroad entity. It considered and rejected the following alternatives:

- ICC R-1 Entity.
- Operating Entity.
- ICC Consolidated Entity.
- Consolidated Entity.

### ICC R-1 Entity

Until December 1986, railroads used the R-1 entity to determine revenue adequacy. Class I railroads structured as separate legal entities reported annually the results of operation and related financial statements in accordance with ICC regulations. They separately reported railroad operations and non-railroad operations.

### Operating Entity

This alternative represents the narrowest definition of entity. It may be viewed as the lowest possible

reporting level which functions as a separate transportation operating unit. Because an R-1 entity typically consists of multiple operating entities, this alternative probably would require most railroads to file more reports than are currently required.

### **ICC Consolidated Entity**

The ICC, in its December 1986 decision in Ex Parte No. 393 (Sub-No. 1), adopted a revised entity for revenue adequacy determinations to include all Class I railroads under common control that are operated as a unified, jointly managed system. As part of this decision, the ICC required the inclusion of those subsidiaries that are at least 50-percent owned by the Class I railroads and which pass the ICC-defined "but for" test.

### **Consolidated Entity**

This alternative combines activities of affiliated railroads and their railroad-related affiliates into a single entity representing the consolidated railroad enterprise. The consolidated entity differs from the ICC consolidated entity in several areas.

Present ICC practice (1) excludes railroad-related affiliates not directly owned by the railroads, (2) requires 50 percent or greater ownership to establish control, (3) uses a different test for determining whether an affiliate is predominantly railroad related, and (4) does not recognize gain or loss in railroad operating income from sale or reclassification of railroad operating assets.

## **ANALYSIS OF ALTERNATIVES**

The arguments for selection of entity consist of

- Economic Accuracy,
- Practicality,
- Data Integrity,
- Comparability, and
- Confidentiality.

### **Economic Accuracy**

To provide for economically accurate measurement of railroad costs, the entity must represent the underlying business enterprise providing railroad transportation services.

A business enterprise is a collection of economic resources (assets) under unified management control in which owners, creditors, and others have an economic interest.<sup>2</sup> Regardless of its organizational or legal form, the business enterprise applies its economic resources to the production of goods and/or services. It is a means of organizing the productive activities to use economic resources efficiently and to compensate those providing cash and non-cash resources.

Business enterprises invest cash in noncash resources (labor, materials, land, plant, equipment, and other goods and services) to produce and sell goods or services for cash (or claims to cash). If the business enterprise is economically viable, the sale of those goods and services should bring in more cash than was spent to obtain the resources used to produce the product.

The cash received is used to pay those providing resources (suppliers, employees, etc.) and those providing capital (lenders and owners). Positive cash flows—and expectations of positive cash flows in the future—enable the business enterprise to obtain the goods and services needed to produce the product and to attract the capital required (in the form of borrowed or equity funds) from the competitive capital markets. A committee of the American Accounting Association recognized the need for an entity concept in 1965 when it found that:

"Accounting is possible only when there is an area of economic interest that can be defined. Indeed, this is the essence of the entity concept in accounting. When a definable area of economic interest exists, it is possible to identify, accumulate, and report financial information about that entity as distinct from all other information. Without such an entity, accounting is impossible."

<sup>2</sup>This discussion relies on, but is not limited to, materials provided by the staff of the FASB. It begins on p. 62 of an Apr. 7, 1986, draft by Reed K. Storey and Diana W. Kahn which is part of an FASB research report intended to provide economic and legal background for the FASB's reporting entity concept. The FASB draft, in turn, draws on and paraphrases paragraphs 10-17 of FASB Concepts Statement No. 6, *Elements of Financial Statements*.

The accounting community concluded that, to present the results of operations and financial position accurately, all business and economic activity under common control should be consolidated to present a single reporting entity.

Generally, transactions that do not take place at arms length may be subject to manipulation by the controlling party. The most practical way to minimize the effects of price manipulation among affiliated parties is to require consolidation.

The presence of control as the determinant for consolidation is further supported by Accounting Research Bulletin (ARB) No. 51, which states:

“There is a presumption that consolidated statements are more meaningful than separate statements and that they are usually necessary for a fair presentation when one of the companies in the group directly or indirectly has a controlling financial interest in the other companies.”

While GAAP presumes that consolidated statements are more meaningful than separate statements of affiliates, the need for information on individual lines of business in which diversified corporations are engaged has also been recognized.

However, the RAPB recognizes that the objectives of the Interstate Commerce Act (ICA) focus on less than the total activities of an enterprise. Specifically, the ICA explicitly distinguishes rail carriers from other modes in requiring cost information. For example, the ICA specifically addresses railroad revenue adequacy determinations (49 U.S.C. 10704 (a)(2)), rate reasonableness determinations that require cost information (49 U.S.C. 10701a), and jurisdictional cost tests for market dominance (49 U.S.C. 10709).

Moreover, 49 U.S.C. 11162 requires that the RAPB establish principles governing railroad costs. Consequently, the Entity Principle only requires reporting of railroad-related information. The Principle requires such information for the combined railroad entity to address concerns regarding the significant transactions that may take place among railroad-related affiliates.

Several commenting parties stated that combined reporting of affiliates that are not part of a unified and jointly managed system should not be required.

They maintain that in such cases, the desire to reflect the activities of a jointly controlled railroad economic enterprise is not achieved. Moreover, these parties state that to require combined reporting for affiliates which are not part of a unified and jointly managed system would impose an additional costly reporting burden producing no identifiable benefits.

The primary concern requiring combined reporting for railroad-related affiliates is that transactions among such affiliates do not take place at arms' length. If the affiliate is predominantly railroad-related, significant intercompany transactions of railroad-related goods or services are likely to occur. Consequently, significant opportunity exists for wealth transfer without recognition for regulatory purposes.

The RAPB considered addressing the transfer of wealth through intercompany transactions by either (1) direct regulation of such transactions (for example, requiring that transactions be recorded at fair market value and gains or losses be recognized at the time of the transaction) or (2) by consolidating/combining accounting data, thereby eliminating the effects of the intercompany transactions. The RAPB selected the latter approach on the basis of the Practicality and Data Integrity Principles.

The Data Integrity Principle would require extensive documentation and audit coverage to ensure that related party transactions produced results similar to those obtained from fair market value transactions conducted at arms' length. Audit coverage would involve considerable expense; even so, it would retain a certain degree of subjectivity.

The RAPB determined that the possible effects of manipulation could be eliminated more practically by requiring consolidation of railroad-related affiliates under common control, eliminating the effect on regulatory measures from transfer pricing.

The statements regarding a “unified and jointly managed system” imply that either (1) transactions among affiliates that are not part of such a system are infrequent and immaterial (both separately and collectively) or (2) the transfer pricing decisions are made at an organizational level (and use a company policy) which consistently requires fair market value to be used. The Practicality Principle will permit the ICC to exempt reporting for railroad-related affiliates which are able to demonstrate that one of the two conditions are met.

Another commenter questioned the benefit of requiring that noncontrolled companies be included in the railroad entity using the cost or equity method required in the Exposure Draft. Because the RAPB agrees that there would be little incentive for transferring wealth to noncontrolled companies, noncontrolling ownership interest in railroad-related companies should be either excluded from the railroad entity or considered nonrailroad-related and segregated from railroad-related information.

### **Practicality**

The three components of practicality are feasibility, cost effectiveness, and materiality. Feasibility does not serve as a discriminatory criterion, since all of the alternatives considered are feasible. Cost effectiveness is the major discriminatory criterion and is the primary subject of this section. Materiality has been used only as it applies to cost effectiveness and economic accuracy.

Either the consolidated entity adopted by the RAPB or the ICC consolidated entity appears to be cost effective. The cost of report preparation appears only moderately higher than the R-1 entity, but greater economic accuracy is achieved through consolidation.

The consolidated entity should report all of the material railroad-related activities of the railroad business enterprise. Ideally, railroad-related activities in the accounts of each affiliate would be specifically identified. While this method is most economically accurate, it may not be feasible. Even if it is feasible, it would be more expensive to implement.

Two alternatives may be followed if specific identification is not practical. First, accounts of affiliates may be prorated using appropriate allocation bases. Such a method would permit the desired segregation and reporting of railroad-related information. However, it is perceived by some to have limited economic accuracy.

Second, in certain situations, railroads may not find it cost effective to separate railroad-related from nonrailroad-related activities. In such cases, railroads may include or exclude entire affiliates on the basis of whether or not they are predominantly railroad-related, that is, whether or not they could continue to exist but for the revenue derived from or support provided to railroad operations.

The RAPB "but for" test describes relationships among affiliates where significant potential for transfer of wealth through transfer pricing practices exists.

The ICC previously adopted a different "but for" test but it applies only to railroad subsidiaries and not to their affiliates. This test states that "but for" the existence of the subsidiary, the railroad would have to create an operation to provide equivalent goods or services. In other words, the good or service provided is not readily available due to its unique railroad nature.

While it may be easier to measure only unique railroad subsidiaries, the RAPB believes that to do so would ignore transactions with other affiliates or require extensive procedures to ensure the integrity of the data reported for those transactions. Significant audit and disclosure requirements would be required for railroad-related transactions with affiliates not included in the entity. Therefore, the RAPB believes its test provides a more practical method for eliminating the possible effects of manipulative transactions between affiliated parties.

One commenter has stated that the specific identification method of segregation is practical for affiliated railroads because of their accounting systems and past reporting practices. It has stated further that inclusion or exclusion of affiliates should be made on the basis of whether or not they are predominantly railroad-related because the specific identification method is too costly and the proration of accounts method is not sufficiently accurate.

The RAPB believes that the cost effectiveness of segregating railroad-related activities must be determined in each case on the basis of the economic accuracy achieved, the materiality of the information, and the cost of preparing the information.

### **Data Integrity**

While adequate audit coverage may be established for each of the alternatives considered, the ability to rely on the internal controls and audit coverage required for external financial reporting favors either consolidated entity. Both are usually comprised of organizational units which are subject to independent audit requirements for financial statement reporting. As the operating entity is not subject to external audit for financial statement reporting,

establishing adequate audit coverage would require greater expense.

Data integrity also requires a determination as to whether transactions (or reclassification) with affiliated parties are recorded at fair market value. When transactions between related parties are minimized (such as in consolidated entities), fewer transactions must be reviewed. Thus, it is more practical to verify the integrity of the remaining transactions.

### **Comparability**

Railroad enterprises have developed numerous organizational forms to structure their activities. While these forms range from a single corporation to multiple affiliates structured by function, the consolidated entity most effectively provides for comparability between railroads. Use of the consolidated entity is the most effective means of comparing the returns of the railroad entity with the returns available in other industries.

### **Confidentiality**

The alternative entities considered by the RAPB treat confidential information differently. The operating entity requires making information publicly available which is presently maintained only for internal use. The ICC R-1 entity would not require any change in disclosure of information. Consolidated annual reports would not require making internal information available to the public. However, separately reporting information about railroad-related activities may require additional disclosures about railroad-related affiliates.

### **USE OF GAAP**

The RAPB evaluated GAAP as a basis for developing annual expense information and presenting the results of operations and related schedules in the R-1 reports. GAAP describes preferred practices and procedures. Its general acceptance is evidenced by its authoritative recognition as an objective by the accounting profession, the financial and business communities, and the general public. It represents the most practical method for recording and reporting the results of operations and related financial statements. GAAP requires consolidated reported information for an entity with two or more corporations.

The Entity Principle generally requires GAAP to be applied as if the railroad entity were a GAAP reporting entity. However, the regulatory purposes addressed by the Entity Principle may require information about an entity that is smaller than the GAAP reporting entity. For those situations in which reliance on GAAP is not practical or does not meet railroad regulatory needs, it identifies specific departures.

For example, the Entity Principle requires segregation of railroad-related from nonrailroad-related working capital. To segregate railroad-related current assets and current liabilities for separate reporting would be time-consuming and somewhat arbitrary. As a practical solution, the ICC relies on a formula-based approach. Generally, commenters found the ICC's approach acceptable for measuring working capital.

The operating entity represents the least cost effective alternative for determining the entity (although it does have attractiveness for certain costing applications). It increases the cost of preparation while it may reduce economic accuracy because it has the greatest number of affiliated transfer payments.

The prior ICC R-1 entity represents the least change in the cost of preparing reports. However, in some cases, it also may have limited economic accuracy because of the relatively high number of affiliated transfer payments.

### **USE OF FAIR MARKET VALUE**

A principal attribute of economically accurate costs is its representation of the underlying economic value of transactions. Traditionally, this underlying economic value has been determined by the marketplace. Fair market value represents the results of good faith bargaining between knowledgeable sellers and buyers (Kohler, 1970).

#### **Transactions Between the Railroad Entity and Others**

The use of fair market value as a basis for recording railroad-related transactions between the railroad entity and those outside the entity ensures that the full economic consequences of the transactions are reflected. Such an approach tends to eliminate concerns about the transfer of economic wealth (in the

form of unrecognized gains) to unregulated affiliates.

Also, because the railroad-related activity of the railroad entity recognizes the difference between cost or book value and market value when the transaction occurs, the gains and losses attributable to the regulated investment base are included in results of regulated operations.

Because enhanced economic accuracy lessens concerns regarding transfer of economic wealth, fair market value should be used in accounting for transactions with those outside the railroad entity. Fair market value represents the value currently recorded for most transactions because typically they are arms' length, marketplace transactions between unrelated parties.

### **Reclassification of Assets and Liabilities**

The amounts and timing of gain or loss are also of concern in reclassifying assets or liabilities between railroad-related and nonrailroad-related status. The amount of gain or loss is to be determined on the basis of the fair market value of the asset or liability at the time of reclassification.

Determining when the gain or loss should be recognized requires resolution of the conflicting objectives of conservatism, proper matching, freedom from manipulation, economic accuracy, and theoretical preference. The RAPB believes that current recognition of gains or losses best resolves the issues.

### **Conservatism**

The primary reason for concern is that the recognition of the gains on reclassification may violate conservatism. In this context, conservatism refers to the general perception that understating is preferable to overstating net income when the amount is uncertain. However, according to FASB *Statement of Financial Accounting Concepts No. 2*, "Qualitative Characteristics of Accounting Information:"

"Conservatism is a prudent reaction to uncertainty to try to ensure that uncertainties and risk inherent in business transactions are adequately considered. . . . However, it does not require deferring the recognition of income beyond the time that adequate evidence of its existence becomes available or justifies recognizing losses before there is adequate evidence that they have been incurred."

Conservatism must be constrained by the requirements of faithful representation (see validity as discussed in Ch. 4, p. 21). In assessing the prospect that as-of-yet uncompleted transactions will be concluded successfully, a degree of skepticism may be warranted.

### **Proper Matching**

The accounting concept of matching requires the recognition of related revenues and expenses within the same accounting period regardless of when cash is received or paid. The principle of matching is often invoked as the basis for accruals (and deferrals) under accrual accounting (Kohler, 1970). Accrual accounting is the recognition of revenues, expenses, gains, and losses and their related increases and decreases in assets and liabilities. The goal of accrual accounting is to account for the effects of transactions (to the extent that those financial effects are recognizable and measurable) in the period in which they occur instead of deferring recognition until their eventual sale or other disposition.

The effect of the reclassification for regulatory purposes must also be considered. Regulation is concerned with the value of the regulatory investment base, which comprises assets used in railroad-related activities.

Thus, regulatory purposes are met if transactions dealing with assets in the regulated investment base are measured at fair market value. This method of measurement can be viewed as an internal accounting convention for the use of management and the regulator. One commenter pointed out that GAAP does not address the transfer pricing of intracompany transactions, presuming that consolidated general-purpose financial statements are most meaningful for shareholder reporting and any intracompany profit or loss is eliminated in the consolidated financial statements of the GAAP entity.

### **Freedom from Manipulation**

The ability to defer or accelerate recognition of a gain or loss until subsequent disposition provides an opportunity to manipulate the timing of recognition or the value of the investment base. If such manipulation occurs, the economic impact of the transactions are distorted.

Two examples illustrate the potential for manipulation. In the first case, an asset for which book

value exceeds fair market value can be disposed of in times of high railroad-related profits, rather than at the time the asset left railroad-related service. In the second case, an asset can be reclassified as nonrailroad-related and then leased rather than disposed of, permanently delaying the recognition of gain or loss.

While recognition of gain or loss at the time of reclassification minimizes the effects of such manipulation of earnings, it may promote manipulation of the regulated investment base through repeated reclassification between railroad and nonrailroad-related status. The investment base manipulation may be minimized through adoption of procedures to prohibit it.

### **Economic Accuracy**

The economic substance of transferring an asset or liability to a third party or transferring to a nonrailroad-related affiliate (and recognizing the gain or loss immediately) is identical to reclassifying an asset or liability from railroad-related to nonrailroad-related. Each transaction or reclassification recognizes that an asset or liability has left (or entered) railroad-related service and is no longer relevant to the measurement of (regulated) railroad-related activities. In each transaction, the railroad entity has the opportunity to receive the fair market value of the transaction.

If a fair market value can be established for these transactions or reclassifications, recognizing them when they occur will lead to more accurate measurement and reporting of the economic substance of the transaction. Deferring the gain or loss until such time as the proceeds are actually realized by the railroad entity can significantly distort the economic substance of the transactions.

### **Theoretical Preference**

The theoretically preferable entity would include only railroad-related activities to provide the information required to accomplish the regulatory objectives of the ICA. For an entity to contain only railroad-related activities, the value of assets not required for the support of railroad activities must be removed from the entity. Removal of asset value may be accomplished by recognizing either (1) liquidation and distribution of the proceeds or (2) distribution to investors (or nonrailroad-related

affiliates). The liquidation or disposition of an asset from a purely railroad-related entity causes recognition of gain or loss.

The Entity Principle departs from the theoretically preferable entity (purely railroad related) by permitting inclusion of nonrailroad-related activities consistent with the Practicality and Data Integrity Principles. However, the Entity Principle requires that when information about nonrailroad-related activities is included in the entity, it shall be segregated and reported separately. The separate reporting of nonrailroad-related activities enables approximation of the results that would have been obtained if only railroad-related activities were included. Gain or loss is recognized when assets are removed from the railroad-related portion of the entity (even through reclassification to the nonrailroad-related portion of the entity) in a manner identical to the treatment given in an entity that is solely railroad related.

The proceeds from liquidation, or the fair market values of the assets retained as nonrailroad-related property, could only remain in the investment base if they were demonstrated to be necessary for supporting railroad-related activity. Otherwise, they would be segregated and treated as if they had been distributed to nonrailroad-related affiliates.

Several parties commented that compliance with this portion of the Entity Principle would impose substantial record-keeping burdens on railroads. They stated that the additional cost of fulfilling reporting requirements associated with the recognition of gains or losses when assets are reclassified is not justified by commensurate benefits.

The RAPB believes that, as a matter of principle, its treatment of reclassification of assets results in economic accuracy. In instances where reclassification of an asset is immaterial, application of the Practicality Principle permits exceptions to the Entity Principle. Exceptions on grounds of practicality are best considered by the ICC on a case-by-case basis.

## **APPLICATIONS AFFECTED**

The Entity Principle affects all of the specific regulatory applications addressed by the RAPB except for the RCAF.

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# CHAPTER 6

## Cost of Capital Principle

### STATEMENT OF PRINCIPLE

The cost-of-capital rate shall be a weighted average computed using the proportions of debt and equity as determined by their market values and their current market rates.

The current market rate shall be the nominal rate of return required by investors in railroad enterprises in the relevant period.

A nominal rate is a rate that includes the effects of inflation.

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### EXPLANATION

Cost of capital is the cost of debt and equity financing, that is, the return required by lenders and stockholders. That return was described by the Supreme Court in *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944):

“From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. . . . By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence

in the financial integrity of the enterprise, so as to maintain its credit and attract capital.”

A cost-of-capital rate consists of three components: the cost of debt, the cost of equity, and the choice of weights with which to combine these costs into a single rate.

A cost-of-capital rate is closely related to the measurement of assets and to their subsequent depreciation and amortization. The relationship is particularly close with respect to the treatment of inflation. To improve the clarity of the presentation, the RAPB has elected to treat assets separately in Chapter 7, “Asset Valuation and Related Expense.”

A principle is required to resolve two long-standing issues:

- The selection of a method of measuring cost of capital.
- Determination of the extent to which cost of capital should be smoothed or averaged over a period of years to reduce the volatility of the rate.

Whether the cost-of-capital rate should be computed at the level of the individual railroad (or holding company) or on an industry-wide basis must be determined for each application affected (see p. 37).

## **ALTERNATIVE MEASUREMENT METHODS**

The RAPB considered three alternative methods for measuring cost of capital: the traditional nominal cost of capital, the current nominal cost of capital, and the real cost of capital. Each is discussed below.

### **Traditional Nominal Cost of Capital**

This alternative is the predominant regulatory model used for public utilities.

Debt is measured at embedded cost, that is, at the cost at the time debt was incurred. Embedded cost is an incurred-cost concept because it is based on actual outlays. It comprises actual interest payments, accruals, and amortization of premium and discount.

Equity, on the other hand, is measured at current cost; it is the return currently expected by the market for investments with similar degrees of risk. It is an opportunity (as opposed to an incurred) cost in that it measures the best return that investors could get on equally risky alternative investments.

Debt and equity rates are combined into a weighted average using the book values of debt and equity. The resulting cost-of-capital rate is applied to an investment base measured at historical cost less accumulated depreciation and amortization.

### **Current Nominal Cost of Capital**

This alternative is currently used by the ICC. It differs from traditional cost of capital in that the opportunity cost concept is applied to debt as well as to equity. Debt is measured at current cost, that is, at the return currently expected by bondholders and other creditors. Equity is measured at current cost, just as it is under the traditional model.

Debt and equity rates are combined into a weighted rate using the market values of debt and equity. (This method contrasts with the traditional method, which uses book values as weights.) As under the traditional method, the resulting cost-of-capital rate is applied to a net historical cost investment base.

### **Real Cost of Capital**

The real cost of capital is the current nominal cost of capital with the inflation premium removed. Investors are compensated for inflation through measuring the investment base at a current value.

## **ANALYSIS OF ALTERNATIVE MEASUREMENT METHODS**

The RAPB selected the current cost of capital for the following reasons:

- Competitive Markets.
- Windfall Gain.
- Opportunity Cost.
- Consistent Measure.
- Practical Considerations.

### **Competitive Markets**

The RAPB believes that the current cost of capital is necessary for railroads because, according to ICC data, a high proportion (80 percent) of their business is no longer subject to ICC maximum rate regulation.<sup>3</sup> As a result, a large share of the indus-

<sup>3</sup>Waybill sample data provided by the ICC indicate that approximately 80-84 percent of the industry's traffic moves at reported rates which produce revenue-variable cost percentages below the current jurisdictional threshold of 180 percent. In addition, some traffic with revenue-variable cost percentages above the jurisdictional threshold is not subject to ICC maximum rate regulation.

try's revenues are determined by competitive markets rather than through the regulatory process.

While a monopoly with a relatively inelastic demand schedule may be able to recover (on a lag basis) all of its debt costs by consistently including in prices the embedded cost of debt, a firm in a competitive market may not be able to recover such costs. For example, if current interest rates are lower than the embedded cost of debt, competitors—new entrants or existing firms seeking to expand capacity—will set prices that are based on those low current rates. In such circumstances, the existing firm may not be able to recover the interest costs on its noncallable debt.

Some commenters believe that the RAPB erred by assuming that both revenue-adequacy determinations and competition restrain total revenues. They pointed out that regulation cannot limit rates on the portion of traffic that is competitive (not subject to maximum-rate regulation).

While the RAPB agrees that maximum rate regulation only affects certain traffic, applying an embedded cost of capital to regulated traffic is inconsistent with the market's application of a current cost of capital to the railroad's competitive traffic.

### **Windfall Gain**

The RAPB concluded that the competitive market in which railroads sell their services will permit railroads to recover only the current cost of capital. In such markets, measuring the cost of debt at embedded cost would deny railroads the opportunity to recover over time the full amount of their interest cost. They could recover only the lesser of embedded cost or current cost. When embedded cost is lower than current cost, regulation would restrict recovery to embedded cost. When embedded cost is higher than current cost, competition would restrict recovery to current cost.

Commenters noted that recovery of the lower of embedded or market rates would occur only if the debt were noncallable. To a significant extent, railway indebtedness is noncallable, consisting of equipment trust certificates, conditional sales agreements, or other similar arrangements that are essentially noncallable. Because the debt cannot be called, railroads bear the risk of financial leverage.

The RAPB considered the argument that the current

cost of capital may give a windfall gain to shareholders. Proponents of the traditional cost of capital point out that, regardless of how much the market rate of interest changes during the time a loan is outstanding, a lender receives only the interest payment contracted for at the time the loan was made. Consequently, when prices are based on the current cost of capital, the difference between the embedded and current costs of debt flows to shareholders, not to lenders. Thus, the shareholders have the opportunity to receive the difference as an increase in earnings above a "normal" current cost of equity, a result that some people believe to be a windfall to railroads and an inequity to shippers.

The RAPB notes, however, that if the embedded cost-of-debt rate is greater than the current cost-of-debt rate, shareholders also have the "opportunity" to suffer a decrease in earnings below a "normal" cost of equity. In any event, the use of a current cost-of-capital rate is appropriate, as long as both the opportunity for gain and the risk of loss are borne equally by the shareholders.

### **Opportunity Cost**

The RAPB believes that the concept of opportunity cost should be applied to debt as well as to equity. Such treatment is necessary for railroads to attract capital in competitive markets. All parties agree that the opportunity cost of equity is the appropriate measure.

The RAPB favors the current cost of capital because it directly measures the sacrifice necessary to attract capital. Costs of debt and equity are measured by the income that is sacrificed from not making the best alternative investment. For example, suppose that 17 percent is the best expected return available from investments comparable in risk to an equity investment in a railroad. Investment in the railroad deprives the investor of the 17-percent return that could have been made in the alternative investment. That foregone return is the cost of equity to the railroad, the return it must pay to attract equity investment. Similarly, if a prospective lender can expect a return of 13 percent on another investment of comparable risk, the pretax cost of debt to the railroad is 13 percent, the return it must pay to attract debt capital.

The traditional cost of capital, on the other hand, treats the cost of debt as an incurred cost, a cost measured by the expenditure of cash, like fuel and

wages. If, in the above example, the firm is actually paying interest expense of 11 percent (including the amortization of premium or discount), 11 percent is treated as the cost of debt. The RAPB believes that this treatment does not adequately measure the sacrifice necessary to attract capital.

Some commenters stated that the opportunity cost of capital is only relevant in determining whether a new investment will produce adequate revenues. They point out that revenue-adequacy determinations, on the other hand, are based on the prior year; consequently, they consider the relevant measure to be the interest expense incurred in that year (the embedded cost of debt).

While revenue adequacy determinations are calculated using information from a prior year, the calculated ROI is an estimate of future results. Therefore, the relevant cost of capital is the opportunity cost of investing in railroad assets. The expected returns available from railroad assets are compared by investors with the expected returns available from other investments. For consistency, the debt component of the opportunity cost of capital must be the anticipated future interest expense; interest expense incurred in a prior year is irrelevant to such a comparison.

### **Consistent Measure**

The RAPB concluded that the market values of debt and equity should be used as weights to combine the current costs of debt and equity into a current cost-of-capital rate. The alternative was to use as weights the book values of debt and equity.

The RAPB viewed the choice between market and book values as necessarily related to its choice between the current and embedded cost of debt. In the RAPB's view, market-value weights are only consistent with the current cost of debt while book-value weights are only consistent with the embedded cost of debt. Therefore, for the same reasons it selected the current cost of debt, the RAPB also selected market-value weights.

### **Practical Considerations**

The RAPB decided that investors should continue to be compensated for inflation by use of a nominal cost-of-capital rate rather than by measuring the investment base at current cost. The RAPB selected the most common method of compensation: appli-

cation of a nominal cost-of-capital rate to an investment base measured at net historical cost (historical cost less accumulated depreciation and amortization). This method compensates investors for expected changes in the general price level.

The RAPB's decision in favor of nominal rates was made in the context of the RAPB's overall treatment of inflation. (See Ch. 7, "Asset Valuation and Related Expense" for a discussion of the treatment of inflation with respect to assets.)

The RAPB decided against the use of a real cost-of-capital rate for practical reasons. The real cost of capital requires estimates of rates of inflation expected by the market. Moreover, in theory it requires estimates of both (1) the expected rate of general inflation and (2) the expected rates of change in the specific cost indices in use. If the general inflation rate were used alone, investors might have more protection from inflation than they would have in competitive industries. If, on the other hand, the expected rate of change in the specific index were used alone, investors may earn a return under or over their cost of capital.

Rates of inflation expected by the market are difficult to measure because they cannot be observed and are long-term in nature. Moreover, one-year measures of inflation could well result in unstable real rates, thus nullifying the benefit of stability, the primary benefit real rates purport to offer.

## **ALTERNATIVE SMOOTHING METHODS**

The RAPB considered two methods of reducing the volatility inherent in annual cost-of-capital rates: (1) use of a moving average and (2) smoothing of the market values used in the calculation of the cost-of-capital rate to weight the costs of debt and equity.

No commenter supported smoothing. The RAPB considered the rationale presented by the commenters and concluded that smoothing is inappropriate for two reasons:

- The measurement of annual cost-of-capital rates should reflect the volatility in those rates. Smoothing would violate the Data Integrity Principle by making annual rates seem less volatile than they really are.

- Smoothing of cost-of-capital measurements for revenue-adequacy determinations is a matter of regulatory policy rather than a cost accounting issue.

## **APPLICATIONS AFFECTED**

All regulatory applications are affected by the Cost of Capital Principle. In all cases, the current nominal rate is used. However, whether an individual or national rate is used depends upon the requirements of the specific application.

### **Revenue Adequacy**

The RAPB considered two choices with respect to the level at which cost of capital should be determined: (1) the level of the entity required for revenue-adequacy purposes and (2) the level of the industry as a whole.

The RAPB concluded that, with one exception, the use of an industry-wide cost-of-capital rate should be continued. Further, the RAPB believes the rate should continue to be computed on an aggregate basis for a sample of financially sound railroads.

The use of an industry-wide rate provides an incentive to manage efficiently. If, because of efficient management, a railroad is able to attract capital at a lower-than-average rate, use of an average to determine revenue adequacy may enable the firm to retain some of the benefits of its low cost of capital. Similarly, if a railroad has a high cost of capital, use of an average encourages it to become more efficient.

The RAPB also believes that the use of an average rate makes the estimate of the cost of equity more reliable. Litzenberger puts the matter as follows:

“It is very difficult to obtain reliable separate cost of capital estimates for individual railroads. The margin of error associated with esti-

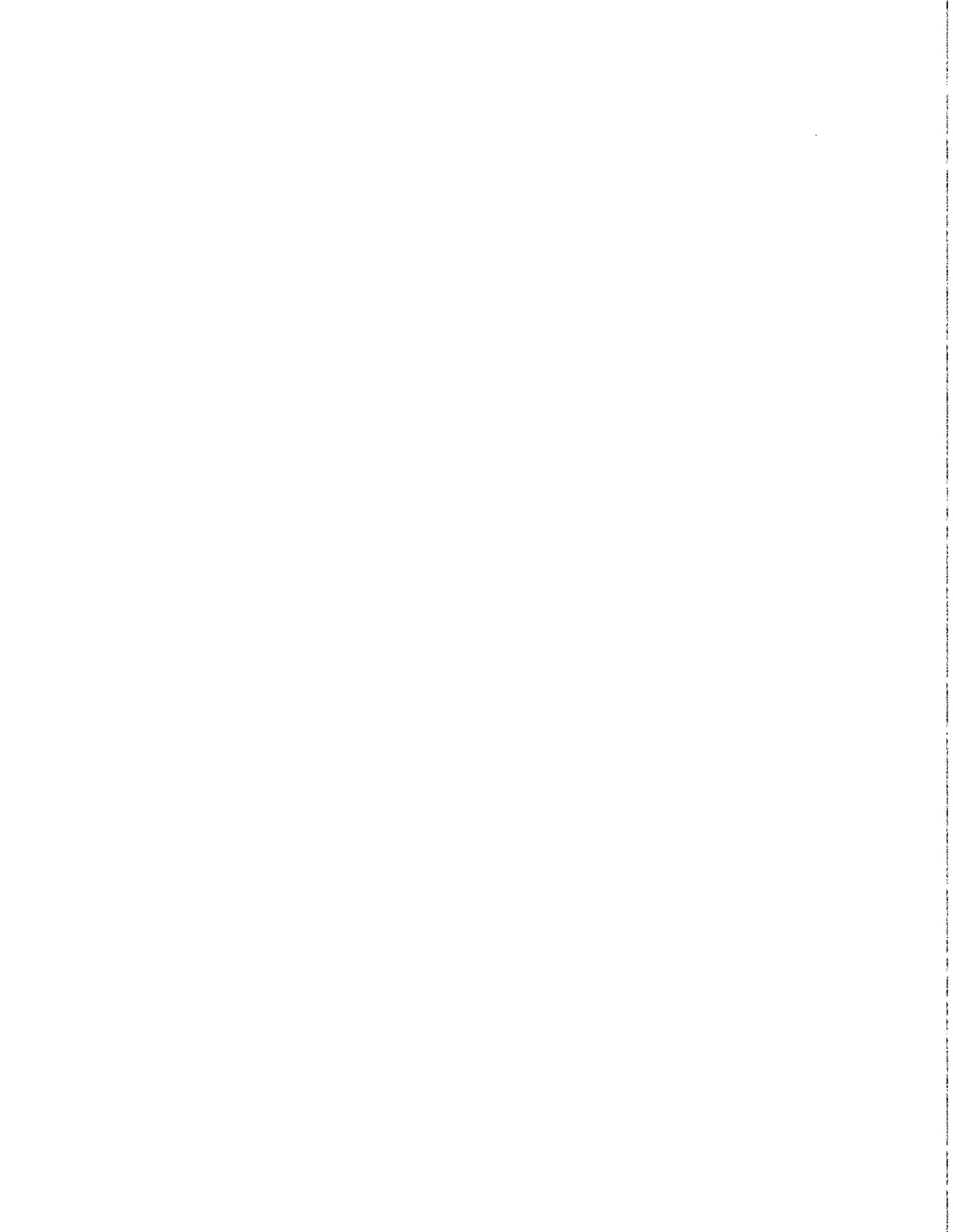
mates of capital cost for individual railroads would be too large to be able to detect any intra-industry differences in true capital costs that may or may not exist. A composite cost of capital estimate for a large group of investment grade railroads is, in my judgment, a reliable estimate of the true cost of capital to an individual railroad.” (Litzenberger, Verified Statement, Ex Parte No. 393, Mar. 1981)

The RAPB believes that to measure cost of capital on an industry-wide basis, the use of the current cost of debt is most appropriate. The current cost of debt does not differ among firms as much as the embedded cost of debt. Furthermore, according to financial literature, the current cost of capital of individual firms is, within reasonable boundaries, independent of their capital structures. Consequently, while an industry-wide traditional cost-of-capital rate (incorporating the embedded cost of debt) may or may not reasonably represent the traditional cost of capital of individual railroads, an industry-wide current cost-of-capital rate can be expected to reasonably represent the current cost of capital of individual railroads.

An exception to the use of an industry-wide cost-of-capital rate is acceptable where a railroad is shown to face materially different economic circumstances (beyond the control of railroad management) than those of the industry. In such a case, that individual railroad's cost-of-capital rate may be used.

### **All Other Applications**

For other regulatory applications, the determination of whether to use an individual or industry-wide rate should be based on the Causality and Practicality Principles. Generally, the Causality Principle would indicate that individual rates are preferable to industry-wide rates. However, the Practicality Principle would permit the industry-wide rate, a less expensive method to apply, to be substituted.



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# CHAPTER 7

## Asset Valuation and Related Expense Principle

### STATEMENT OF PRINCIPLE

Assets shall be valued at either the value of the resources forgone by the entity to acquire the assets (GAAP cost) or at the current market value, depending on the regulatory applications. The method for valuing assets in each application shall be determined by the Causality Principle.

Where the GAAP cost reasonably cannot be viewed as a meaningful regulatory measure of value, other measures of value may be used.

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### EXPLANATION

Valuation of assets is an integral part of determining the cost of railroad-related activities. It is used to determine movement costs, the results of operations, and ROI.

Asset valuation is an important element in virtually all regulatory applications because it forms the basis for measuring the monetary value of resources dedicated to and expended in railroad-related activities. An asset's valuation serves as a basis for calculating both the return of investment (in the form of depreciation expense) and the ROI (in the form of cost of capital). The calculations of each apply to specific movements as well as to the entity as a whole.

The RAPB has concluded that no single asset valuation method is appropriate for all regulatory

applications; different time orientations of the specific regulatory applications require different valuation methods. Additionally, practical problems associated with certain valuation methods preclude their use in certain regulatory applications.

This Principle, therefore, represents a framework for selecting the appropriate valuation method on the basis of each specific regulatory application's time orientation. The Causality Principle identifies how time orientation influences the determination of the asset valuation method (see p. 10).

The RAPB considered five issues related to asset valuation:

- Time Orientation and Valuation Methods.
- Deferred Tax Credits and the Investment Base.
- Appropriate Historical Cost Method.

- Depreciation Accounting and the Restatement of Track Assets.
- Excess Assets and Write-Downs.

## TIME ORIENTATION AND VALUATION METHODS

### Alternatives

The RAPB considered several alternative methods for valuing assets, which are classified into two broad categories: historical cost and current market value. In the historical cost category, acquisition and predecessor costs were the two alternatives considered. In the current market value category, reproduction cost, replacement cost, and net liquidation value (NLV) were the alternatives considered.

### Historical Cost

Historical cost measures asset value at the monetary value of resources sacrificed to acquire the assets. An asset's acquisition cost is amortized over its estimated useful life in railroad-related service. The net investment in an asset is the asset's value reduced by the cumulative amounts amortized. (Three methods for measuring historical cost are compared starting on p. 45.)

### Current Market Value

Current market value may be measured by either the reproduction cost, replacement cost, or the NLV of existing assets.

**Reproduction Cost.** Reproduction cost is the current market value for an identical asset in the same used condition. It represents the entrance value the firm would pay to purchase the assets in use today. Market values may be estimated by either the use of direct quotations (observation) or price indices of used assets.

**Replacement Cost.** Replacement cost is the current market value of the best asset available to

assume the functions of existing assets, thus replacing their existing service potential.<sup>4</sup> If replacement cost values are used, either the asset value or operating expenses must be adjusted to account for changes in operating advantage. Replacement cost may be estimated using either direct quotations or indices of new asset prices.

**Net Liquidation Value.** NLV is the net realizable proceeds from an orderly disposition of assets. As an exit value, it represents the funds available for other investment opportunities. NLV may be estimated either by the use of direct observation or by independent appraisal.

### Analysis of Alternatives

As noted above, no single valuation methodology is appropriate for all regulatory applications. However, the arguments supporting each method are presented here. The selection of the appropriate valuation method is described in the specific regulatory application section of this chapter and in Part II of this volume.

The arguments regarding the alternative valuation methods fall into seven categories:

- Practicality.
- Verifiability and Objectivity.
- Opportunity Cost Measures.
- Compensation for Price Level Changes.
- Capital Requirements.
- Simulated Competitive Markets.
- Predictive Ability.

### Practicality

For certain regulatory applications, such as Revenue Adequacy and GPCS, historical cost is more practical than current market value. Historical cost is prepared presently for financial reporting purposes and thus is readily available. The current market value methods require preparation or com-

<sup>4</sup>The RAPB's definition of replacement cost is similar to the FASB's definition of current cost in FAS No. 33. As defined by FASB, current cost includes an adjustment to asset value for differences in operating costs. The RAPB's definition would permit either adjustment of the cost of the asset or adjustment of the operating expenses themselves.

putation of additional information that is either (1) not feasible or (2) not cost effective to obtain for the entire entity.

For certain other regulatory applications, such as maximum rate proceedings, abandonment/surcharge proceedings, and minimum rate proceedings, current cost is more practical. Generally, preparing the additional analysis accurately for these applications is practical because only a portion of the firm's assets and operations are involved.

Descriptions of feasibility and cost effectiveness considerations follow.

**Feasibility.** For revenue adequacy and GPCS applications, the use of current asset costs requires that the real cost of capital be used to prevent double recovery of price level changes. Maximum rate and competitive access proceedings do not require use of the real cost-of-capital rate to prevent double recovery because price level changes are explicitly included in the discounted cash flow (DCF) method as a separate item, the value of which is contestable. Minimum rate/Long-Cannon factor proceedings generally do not require the use of either the cost of capital or an asset value.

For a given level of risk without regard to inflation, the real cost-of-capital rate is the stable return that investors require. The real cost-of-capital rate is not observable in the financial markets because of the effects of inflation. It can only be estimated by removing investors' expectations regarding price level changes from the nominal (observed) rates.

Although numerous methods for estimating real cost of capital have been proposed, none appear to provide sufficiently reliable results (see Ch. 6, p. 36). Thus, the calculation of an accurate, stable, real cost of capital appears infeasible.

**Cost Effectiveness.** The use of current asset value requires that certain adjustments be made in addition to depreciation expense. To perform these adjustments accurately requires significant time and expense; such an expenditure is not warranted for every regulatory application.

Use of replacement cost for asset valuation and reported operating expenses based on existing assets violates the Data Integrity and Causality Principles. These operating expenses do not represent the use

of the replacement assets and, therefore, do not reflect a causal relationship. The assets used to establish replacement cost are the best assets available to perform the functions of existing assets. As the best available, they presumably include improved technology and efficiency. On the other hand, the reported operating expenses result from the use of less-productive assets.

Economic accuracy can be achieved by adjusting existing operating expenses to take into account the operating efficiencies of the replacement assets, by developing independent estimates of operating expenses associated with those assets, or by adjusting the asset value to consider the present value of any operating advantages. Except for certain specific or narrow applications, either approach is difficult to develop and troublesome to verify.

Reproduction cost adjusts existing asset values to match the current market value of identical assets. Market value may be established by either direct observation or through the use of indices which track changing values. However, on an entity-wide basis, direct observation is both costly and time-consuming.

Alternatively, use of indices is most often suggested as the more economical and efficient way of establishing market value. According to research, however, the use of indices has two practical problems. First, their application to the entire investment base or categories of assets assumes that all assets in the investment base are currently used and useful. To the extent that the investment base includes excess or underutilized assets, indices applied to the entire investment results in a proportionately greater overstatement of operating costs and investment base than occurs under acquisition cost.

Second, some have questioned the use of indices to estimate reproduction cost. Freeman and Willis (1984) note that the use of indices (as presently implemented) frequently measures the cost of new assets and, thus, may not properly represent the effects of technological change.

As with the other two current market value alternatives, use of NLV on an entity-wide basis appears to be impractical. The only accurate method for measuring NLV is to estimate the value of each asset. Preparing an estimate for the firm as a whole may be prohibitively costly. However, for applications that require an exit value for specific railroad

assets, these practical problems may be less significant.

### **Verifiability and Objectivity**

Historical cost is generally a more verifiable and objective method for measuring the cost of assets than current cost. Historical cost is determined through and supported by transactions. It is governed by GAAP, a well-defined set of principles.

The use of current market values generally is less verifiable, as its determination depends on the expert (but subjective) judgment of the preparer. The use of price-level indices to adjust historical costs to a market value may be one solution to the subjectivity concern. However, the use of indices may result in subjectivity problems associated with their construction or compilation and practical problems associated with the required adjustment of operating expenses. Additionally, it may be difficult to demonstrate the linkage between the items used in constructing the index and the specific assets of the firm that are to be adjusted.

### **Opportunity Cost Measures**

Certain regulatory applications, such as abandonment, surcharge, minimum rate, and the Long-Cannon factor, are decided on the basis of whether the activity at issue is reasonable in comparison to the best alternative activity. The best alternative activity has an opportunity cost associated with a decision not to pursue it.

The NLV represents the most accurate asset value for determining opportunity cost because it represents the purchaser's assessment of an asset's economic potential in alternative activity. The NLV is affected by demand for the asset. In certain circumstances, such as when the productive capacity of the assets is in great demand, the NLV may approximate replacement or reproduction cost. In other circumstances, such as when there is no longer a demand for an asset's productive capacity, the NLV may represent scrap value.

Usually historical cost is only coincidentally a valid estimator of NLV.

### **Compensation for Price Level Changes**

In many regulatory applications, the objective is to provide the enterprise with the opportunity to cover

its operating expenses and cost of capital, and thus provide for prudent investment. To accomplish this objective, the firm must be able to cover, through its pricing decisions, the effects of price level changes (inflation or deflation).

Asset recovery may be accomplished by valuing assets and depreciation charges with either of two methods:

- Use current values in combination with a real (price level adjusted) cost of capital.
- Use historical values in combination with a current nominal cost of capital.

Using the current value of assets in combination with the real cost of capital is conceptually attractive because it provides for industry-specific price level changes. The degree of price level changes experienced may vary by industry. Moreover, including price level changes in assets specific to an industry implicitly incorporates the specific price level changes necessary to provide for reinvestment in assets.

Using the historical value of assets in combination with the nominal cost of capital provides for general price level changes. General price level changes are implicitly a portion of the current nominal cost-of-capital rate. Investors are compensated for general price level changes through the cost-of-capital rate.

### **Capital Requirements**

One argument favoring current asset valuation is that its use will provide capital adequate to replace the assets of the enterprise. This argument has two underlying assumptions: (1) that funds for reinvestment must be generated internally by the entity (no outside investment can be attracted) and (2) that essentially all assets will be replaced with funds provided from operations in advance of replacement.

The first assumption is not valid if investors can reasonably expect to earn a competitive return. In such cases, funds can be obtained from the capital markets.

The second assumption appears invalid in light of the recent significant railroad activity in writing down impaired assets (see Excess Assets and Write-Downs, p. 49). Had sufficient funds been provided from operations before the write-down, the rail-

roads would be left with a significant surplus of capital to be invested.

### **Simulated Competitive Markets**

An argument for using current market values is that it represents the pricing constraints of a competitive firm. A competitive firm establishes an upper limit on prices on the basis of the economic costs (including cost of capital) experienced by a new entrant. When that firm charges more than the new entrant's costs, new competitors enter the market. Prices will be driven to a point of equilibrium as the supply is increased.

Simulation of the competitive market forces often is used to identify prices for specific movements in relation to specific assets. It is not necessarily used for all regulatory applications, particularly where the objectives differ. In fact, it is precluded by certain practical considerations, as discussed above under Practicality.

### **Predictive Ability**

Certain regulatory applications permit an action to be taken that affects either the future provision of a service or the future price to be charged for a service.

Current asset value is argued to be a better predictor of the costs that will be incurred because it is more up to date. Therefore, it better matches future price (revenue) to future expenses.

To the extent that technology and inflation remain reasonably stable, historic cost measures also can serve as accurate predictors of future cost; current asset value does not provide better matching of future prices to future reported expenses automatically. The expenses reported in subsequent years' financial reports under GAAP will represent a combination of existing and new assets. The predictive accuracy of either the current cost or historical cost method is related to the timing and requirements for purchasing new assets. Also, technological changes associated with new assets require adjustment of operating expenses to accurately predict their total effect.

## **DEFERRED TAXES**

The RAPB concluded that the funds provided by deferred taxes have zero economic cost. The por-

tion of the railroad's assets funded by deferred tax credits are provided by the government, not debt holders or investors. Since the government does not charge interest on the deferred tax "loan," the railroads incur no cost of capital associated for that portion of the investment base funded by deferred tax credits. The deferred taxes should, therefore, be deducted from the asset base.

By the end of 1984, deferred tax credits represented the source of funds used to "finance" 16.3 percent of the \$58 billion of total Class I railroad assets. In the past, the ICC had treated deferred tax credits as having the same weighted average cost of capital as funds provided by debt and equity. In its December 31, 1986, decision in Ex Parte No. 393 (Sub-No. 1), *Standards for Railroad Revenue Adequacy*, the ICC reversed its position and, for future revenue adequacy determinations, elected to treat deferred tax credits as having a zero cost of capital by subtracting the deferred tax credits from the investment base.

In resolving the treatment of deferred taxes, the RAPB considered three questions:

- Should deferred taxes be recognized?
- If so, what cost should be accorded deferred taxes?
- Which method for treating deferred taxes should be used?

### **Recognition of Deferred Taxes**

Two methods of accounting for deferred taxes have been proposed to the RAPB: (1) the comprehensive inter-period tax allocation method as required by GAAP and (2) the flowthrough method. The comprehensive inter-period tax allocation method recognizes deferred taxes but may be applied in several different ways. The flowthrough method ignores deferred taxes entirely but includes inter-period allocation of other expenses (such as depreciation); only actual taxes paid by the railroad are reflected in income.

Advocates of the comprehensive inter-period tax allocation method cite the treatment of accumulated depreciation to explain their support for the recognition of deferred tax expense. Taxes are based on the income generated by assets over their useful life. Thus, recognition of deferred taxes attributable to individual assets is appropriate.

The contingencies applicable to deferred taxes are no different than those in other areas of accounting. To support this contention, the advocates cite the "going concern" concept used in GAAP and the expected continuation of the present tax system.

Those supporting recognition of deferred taxes find support in the fact that individual transactions are planned in light of their tax consequence. They claim that requiring the benefits of accelerated depreciation to be passed on to customers (as in flow-through) would circumvent the intent of the Congress in providing accelerated depreciation. Finally, those supporting recognition of deferred taxes cite its compliance with GAAP.

Some advocates of flowthrough point out that income taxes result from taxable income, not book income. Linking income tax expense to pretax accounting income results from a misperception of the economic nature of income taxes. Further, deferred tax liabilities are really contingent on future income and future tax regulation.

The RAPB is persuaded by arguments in favor of the comprehensive inter-period tax allocation method for recording deferred taxes. It reached this conclusion on the basis of (1) the role that tax considerations play in investment decisions, (2) congressional intent to stimulate investment, and (3) conformance with GAAP.

On September 2, 1986, the FASB issued a *Proposed Statement of Financial Accounting Standards*, "Accounting for Income Taxes." The Proposed Statement would retain the requirement for comprehensive inter-period tax allocation. The Proposed Statement, however, would measure the effects of income taxes by the liability method, in place of the deferred method currently required by the Accounting Principles Board (APB) *Opinion No. 11*, "Accounting for Income Taxes." In most cases, cumulative income statement items will not correspond to balance sheet amounts, as would have resulted under APB *Opinion No. 11*, even though they might be the same in a particular year. An important difference for regulatory purposes is that the liability method would require immediate adjustment of the deferred tax liability to reflect

the effect of a change in tax laws or rates.<sup>5</sup> The Proposed Statement would be effective for fiscal years beginning on or after December 15, 1987. It permits companies to either restate previously issued financial statements or include the cumulative effect of applying the Statement in net income of the year of initial application.

The magnitude of the proposed change will be greatly increased by the change, effective July 1987, in the federal corporate income tax rate from 46 percent to 34 percent. That change affects deferred tax credits that have been accumulated at a 46-, 48-, or other percent rate, but which will be liquidated at a 34-percent rate.

The RAPB generally intends for deferred taxes to be computed in accordance with GAAP, including changes thereto. Consequently, the RAPB expects that deferred taxes will be computed for regulatory purposes under the Proposed Statement when it becomes effective. The RAPB has not, however, considered how the cumulative effect of applying the Proposed Statement should be treated for regulatory purposes. The alternative methods proposed by the FASB may or may not be appropriate for regulatory purposes; that issue is left to the ICC.

### Cost of Deferred Taxes

Three alternatives for recognizing deferred taxes were proposed to the RAPB: the utility method, the finance method, and the "weighted average debt and equity" method. The utility and finance methods (along with an additional DCF method discussed below) value deferred taxes as an interest-free source of capital. The weighted average debt and equity method implicitly values accumulated deferred taxes at the weighted average cost of debt and equity.

Advocates of the utility or finance methods raise three primary arguments. First, the Congress intended to stimulate investment by permitting accelerated depreciation to be used for tax purposes even though other methods are used for financial reporting. The resulting deferral of tax payments to the government provides funds for investment, consistent with the Congress' intent. Second, deferring payments without interest rep-

<sup>5</sup>Under the deferred method, immediate adjustments to the deferred tax account are not made in response to changes in the tax law or rates. Such changes are recognized when timing differences reverse.

resents an interest-free loan from the government. Although such a loan has a cost to the government, it has no cost to the railroad entity. Third, new and existing competitors would have similar interest-free funds available. In a competitive market, competition would force the firm to pass on the reduced cost of capital to customers.

Advocates of the weighted average debt and equity method raise two primary arguments. First, the Congress' intent to stimulate investment will not be met, since firms will not invest if they are not permitted to earn a return on the funds provided by deferred taxes. Second, investors in competitive markets expect to earn a return on all assets.

The RAPB concluded that cumulative deferred tax credits should be treated as a zero cost of capital. In a competitive market, the firm would not be forced by regulators to pass on to its customers the benefits of zero-interest financing. However, a firm may be compelled by competitive circumstances to pass the benefits on to its customers.

### **Methods for Treating Deferred Taxes at Zero Cost**

The two alternatives which recognize deferred taxes as an interest-free source of funds are the finance method and the utility method.

Under the finance method, the development of an industry-wide cost-of-capital rate is adjusted to recognize cumulative deferred tax credits as a zero cost component. This method would violate the Causality Principle because railroads differ materially in the extent to which they are able to finance investments through the use of deferred tax credits.

Under the utility method, deferred tax credits reduce the eligible investment base by the cumulative deferred tax credits. The RAPB concluded that reducing the historic investment base by applicable deferred tax credits is the most practical approach for revenue adequacy and GPCS applications.

An additional alternative, the DCF method, is used for multiyear analyses. Because it does not use the accounting reporting convention of inter-period allocation, neither asset consumption nor taxes are allocated. Use of the DCF method is consistent with the utility method since tax consequences of asset expenditures reduce the net investment in the analysis. When a DCF is used for stand-alone cost,

deferred tax credits are always zero, since this method only includes the taxes actually paid during the life of the investment.

One party urged the RAPB to adopt the finance method for abandonment/surcharge applications. It reasoned that the Causality Principle requires that opportunity costs in abandonment/surcharge cases reflect the treatment of deferred taxes at zero cost. Since the ICC applies a pretax cost-of-capital rate to NLV to determine abandonment/surcharge opportunity costs, the cost-of-capital rate should be adjusted using the finance method so that deferred taxes may be reflected at zero cost.

The RAPB rejects this suggestion. Contrary to the commenting party's assertion, the Causality Principle would preclude use of the finance method in specific applications where no causal link exists between deferred taxes of the entire entity and deferred taxes related to specific branch-line assets. The RAPB believes that proper treatment of deferred taxes, consistent with the Causality Principle, is to recognize the tax consequences associated with specific branch-line assets. This treatment may be accomplished by adjusting NLV to reflect the tax consequences of a gain or loss on disposal of the branch-line assets.

### **APPROPRIATE HISTORICAL COST METHOD**

The RAPB concludes that use of GAAP cost for business combinations represents the superior method for measuring economically accurate costs when using an historical cost method. If a business combination qualifies as a "pooling of interests," it is accounted for as the uniting of the ownership interests of two or more companies by exchange of equity securities. No acquisition is recognized because the combination is accomplished without disbursing resources of the constituents. Ownership interests continue and the former bases of accounting are retained. The recorded assets and liabilities are carried forward to the combined corporation at their previously recorded amounts.

A business combination generally is treated as a "purchase," accounted for as the acquisition of one company by another. The acquiring corporation records the fair-market value of the acquired assets less liabilities assumed as its cost. It records the excess (if any) of the cost of an acquired company

over the sum of the fair values of tangible and identifiable intangible assets less liabilities as goodwill.

The ICC may determine through rulemaking that the use of GAAP cost does not produce meaningful regulatory results in certain situations. For example, if either a depressed or overvalued market value primarily results from government action<sup>6</sup> or regulatory policy, the entity may use another measure, such as predecessor cost or a modification.

### **Alternatives**

The RAPB considered which of three alternative measures of historical cost should be used: acquisition cost, GAAP cost, or predecessor cost.

The RAPB defined acquisition cost as the lower of (1) the aggregate purchase price of the firm or (2) the fair value of the tangible and identifiable intangible assets at the time of the business combination. Any excess of aggregate price of the firm over fair value of the assets would be considered goodwill and not included in the net investment base. Nor could it be amortized against net operating income.

GAAP uses acquisition costs (as defined above) in connection with purchases and reorganizations. In a "pooling of interests," GAAP continues the net book value of the pooling entities. In the RAPB's opinion, the use of GAAP cost is a practical alternative to acquisition cost, as firms presently maintain accounting records on this basis for financial statement presentation. In the analysis below, the theoretical arguments favoring acquisition cost also apply to GAAP cost (except for business combinations treated as a pooling by GAAP).

Predecessor cost represents the cost to the person first devoting the property to public service.

### **Analysis of Alternatives**

The RAPB considered the following arguments in selecting GAAP cost:

- Economic Accuracy.

- Capital Attraction.
- Replacement Cost Approximation.
- Comparable Treatment.
- Windfall Earnings.
- Practicality and Verifiability.

### **Economic Accuracy**

The use of acquisition (or GAAP) cost better represents the economic conditions facing the enterprise than does predecessor cost because a large share of the industry's revenues are determined by competitive markets rather than through the regulatory process. A substantial portion of the railroads' traffic is no longer subject to ICC maximum rate regulation because it falls below the jurisdictional threshold, is exempt, or moves under contract. By implication, when most rates are set by competition, the market values of assets are based primarily on competitive economic conditions and not on the regulatory process.

The use of predecessor cost has been adopted by most public utility commissions to preclude upward or downward manipulation of asset values. However, predecessor cost is appropriate only if market value is established predominantly through regulatory policy. Market value is determined by regulatory policy when the regulated enterprise has sufficient market power such that a material portion of its rates is influenced by what the regulators allow. Alternatively, the market value of the regulated enterprise could be driven to depressed levels by improper regulation.

However, supporters of predecessor cost point out that it would be illogical (circular) to set rates based on acquisition cost because by so doing rates would be dependent on a value which in turn is based on rates. For this to be true, GAAP cost would have to be used directly in ratemaking and the regulated enterprise must possess sufficient market power that rates are materially affected by what the regulator allows. Considering the large share of the railroad industry's revenues determined by the

<sup>6</sup>The restrictive covenants associated with the federal government's sale of its Conrail stock is an example of government action affecting sales price. Section 4012(e)(2) of the Conrail Privatization Act (P.L. 99-509, Title IV (1986)) appears to preclude the use of the sale price of Conrail stock for regulatory purposes.

competitive markets, the RAPB believes that concerns about circularity are probably unfounded at this time.

Also, supporters of predecessor cost state that a lower acquisition value occurs primarily due to the impact of all regulation (including revenue adequacy, maximum rates, car hire, merger, etc.) and not primarily because of excess assets. To address these concerns, the Asset Valuation and Related Expense Principle provides that other measures of value may be used where GAAP cost reasonably cannot be viewed as a meaningful regulatory measure of value.

### **Capital Attraction**

A primary objective of the SRA is to assist railroads in attaining revenue adequacy. To accomplish this objective, investors must be permitted to earn a market return on their investment. As long as investors can earn a rate of return comparable to other market rates of return for investments of comparable risk, they will continue to invest.

Use of GAAP cost is consistent with the objective of enabling railroad entities to attract capital for the replacement of necessary assets. Railroad assets will be replaced so long as competitive returns are allowed on the existing and new investments of the entity. The use of predecessor cost, when higher than acquisition cost, assumes that funds for replacement must be generated in advance of the reinvestment. However, if investors reasonably can expect to earn a competitive return, capital can be attracted when it is required and the accumulation of funds in advance of the reinvestment is not necessary.

### **Replacement Cost Approximation**

Some argue that predecessor cost is closer to replacement cost because (1) replacement costs for the railroads are greater than either predecessor or acquisition costs and (2) predecessor costs are greater than acquisition costs as experienced by the affected railroads. This assertion is not universally true, as may be observed in many other industries where predecessor cost easily may be lower than GAAP cost.

Some have argued that any change in an original cost asset base will produce results which differ from the replacement cost investment models. Static

investment models may be used to demonstrate that a replacement cost investment base used in conjunction with the real cost-of-capital rate can produce results identical to those achieved using an original (predecessor) cost investment base in conjunction with a nominal cost-of-capital rate. However, this argument does not recognize that certain events take place which require recognition in any regulatory asset base measurement.

Two examples of changes that must be recognized are (1) permanently underutilized or earnings-impaired assets that should be valued at the higher of NLV or the present value of the net cash flows those assets can generate in their present use and (2) excess or redundant assets that should be eliminated from the investment base.

In purchase transactions, GAAP cost implicitly values permanently underutilized or earnings-impaired and excess or redundant assets at the higher of NLV or the present value of the net cash flows those assets can generate in their present use. That valuation results because the market price is an efficient measure of the underlying economic value. That valuation is appropriate for underutilized or earnings-impaired assets. When the valuation is less than predecessor cost, the effects of improperly including excess assets in the asset base is minimized.

### **Comparable Treatment**

In considering alternative approaches to asset valuation, comparable assets should be accorded comparable treatment if such treatment is practical. Under acquisition costs, all assets acquired or combined are valued at their fair market value. Thus, regardless of the accounting method, the recorded values of assets are comparable. GAAP cost, on the other hand, considers assets that are acquired in a purchase and those combined in a pooling to represent essentially different transactions. Thus, the assets are not given comparable treatment. However, the RAPB believes that practicality considerations are of greater importance than comparability and that the circumstances associated with pooling are sufficiently different to warrant different accounting treatment.

Similarly, permanently impaired assets should be accorded comparable treatment whether the asset is written down involuntarily (through sale or reorganization) or voluntarily. When an involuntary

write-down of excess assets occurs as part of a purchase or reorganization, the use of predecessor cost effectively nullifies the effect of the write-down unless the assets are voluntarily written down at a later date. However, in such a case, the railroad has had the benefit of an inflated investment base until the voluntary write-down is taken. On the other hand, when a voluntary write-down of assets is made by a railroad's management to recognize excess assets, the reduced net asset valuation is used and the associated losses may be recognized in earnings for revenue adequacy purposes. Thus, if the ICC determines that GAAP cost is not appropriate for a particular regulatory application, the ICC, to achieve comparability, may find it necessary to remove estimated excess assets from predecessor cost.

### **Windfall Earnings**

Permitting competitive returns on an investment greater than that actually made by the successor entity provides that entity the opportunity to earn a return greater than the cost of capital. While this "windfall" is not guaranteed, it represents an opportunity which is not available to investors in competitive enterprises (the requirement for regulation rests on the presumption of certain monopoly powers that must be held in check). On the other hand, under GAAP purchase accounting, an investor paying more than book value for a successful railroad enterprise may be allowed to charge higher rates on captive shipments than under predecessor cost.

### **Practicality and Verifiability**

While not considered explicitly as an argument in the Exposure Draft, the Practicality and Data Integrity Principles directly affect the selection of an historical cost method. Many commenters were concerned about practicality and verifiability in using acquisition cost in a pooling. In light of these concerns, the RAPB decided to address the practicality and verifiability of the three alternatives explicitly.

Some commenters stated that applying acquisition cost to assets acquired in a pooling is too subjective, as it relies extensively on judgment. They noted that the absence of a purchase transaction means there are no records supporting the transaction price. Furthermore, reliance on market valuation at the time of the pooling causes the valuation to fluctuate widely because of the volatility of the equity markets.

Commenters also raised concerns about the merits of applying a market valuation to both parties in a pooling. They stated that such application results in different measurements than those resulting from a purchase in which only the purchased party is revalued.

GAAP represents the most practical and verifiable historical cost method because the records used to support it are the same as those currently maintained by the railroads in support of financial accounting. By permitting the use of pooling, the RAPB avoids the practical problems associated with acquisition cost.

Predecessor cost requires the maintenance of separate predecessor cost records. These records are currently maintained and updated by the ICC on the basis of annual submissions by the railroads.

## **DEPRECIATION ACCOUNTING AND THE RESTATEMENT OF TRACK ASSETS**

To develop economically accurate costs, virtually all parties endorsed the use of annual expenses, prepared in accordance with GAAP. Many recognized the need to adjust the GAAP-generated capital costs. The three elements of capital costs are (1) valuation of the capital asset base, (2) the method of recognizing annual expense for the consumption of assets (return of investment), and (3) the annual capital charge to be recovered (ROI).

The ICC has introduced the use of depreciation accounting (DA) in stages. Since 1983, the railroads have used DA in their R-1 reports to the ICC. Before 1983, railroads used the replacement-retirement-betterment (RRB) method of accounting for track structures. Until 1986, the ICC retained use of the RRB method for revenue adequacy and GPCS by requiring the railroads to furnish supplemental RRB data. In its December 31, 1986, decision in Ex Parte No. 393 (Sub-No. 1), *Standards for Railroad Revenue Adequacy*, the ICC abandoned the use of RRB for revenue adequacy determinations.

Under the RRB method, the acquisition cost of the initial investment is recorded on the books as a nondepreciable asset. No depreciation expense is taken over its estimated useful life. When it is replaced with an asset of similar quality, the entire cost of the replacement is charged to operating

expense. Only the incremental betterment portion of the new asset is added to the books. When the asset is retired, the acquisition cost (original investment), including any betterments, are charged to expense.

In evaluating RRB, the RAPB noted problems or shortcomings which impaired the attractiveness of RRB:

- Under current ICC procedures, a railroad must maintain and report on two separate sets of books for track assets.
- The continued use of RRB for revenue adequacy or any other purpose is no longer in conformance with GAAP.
- While more sensitive to inflation than DA, RRB does not accurately measure the cost of assets consumed in providing service or the asset base devoted to railroad service.

Under the DA method, many of these shortcomings either are not applicable or can be overcome:

- Since railroads converted to DA for financial accounting and R-1 reporting purposes, DA's use in revenue adequacy determinations alleviates the need for the second set of books to support RRB.
- DA is consistent with GAAP.
- While not directly sensitive to inflation, use of DA reduces many of the concerns about inflation when used with a nominal cost-of-capital rate.

As a result of DA restatement procedures and the industry's pattern of track replacement, the differences between ROI measured using RRB and DA are not significant. Thus, the RAPB concluded that DA is more economically accurate.

The RAPB considered a second issue regarding whether the restatement of track asset values resulting from the conversion to DA is appropriate for regulatory purposes. Essentially, a restatement requires railroads to treat existing track assets, which were previously expensed under RRB, as if they had been capitalized and depreciated. The procedure resulted in a substantial net increase in depreciable assets, deferred tax credits, and retained earnings. The restatement is a material amount, with approximately \$7 billion added to the asset base.

The RAPB has reached several conclusions in its analysis of the restatement:

- The restatement will result in certain track asset costs being charged a second time to operating expense over the remaining life of the assets.
- Charging these expenses twice does not necessarily indicate that the railroads will receive double recovery or payment from customers.
- The restated asset base and future operating expenses are the same as if railroads had always been using DA for track structures.

While the RAPB concludes that use of DA with its restatement of track assets is more economically accurate, certain parties have questioned the fairness of permitting the railroads two opportunities to recover the \$7 billion of track assets resulting from the restatement. A determination of the appropriateness of this approach or an alternative for regulatory purposes rests with the ICC which should review the matter (including public participation by all interested parties).

## **EXCESS ASSETS AND WRITE-DOWNS**

Since excess assets in the investment base may cause inaccuracies in the ROI and depreciation expense calculations, all commenters agree that those assets should be identified and eliminated from the asset base. They identified two different approaches for consideration: (1) reliance on existing professional accounting practices and Securities and Exchange Commission (SEC) guidance and (2) regulatory study and investigation of the asset base. The RAPB believes the first approach is adequate.

W.A. Paton and A.C. Littleton, in their *Introduction to Corporate Accounting Standards* (1970), point out:

"If . . . it has become apparent that the effective service life of a[n] [asset] . . . has been seriously curtailed by the unexpected obsolescence or other special factor, and the accrual of depreciation to date is inadequate, the recognition of the additional cost expiration need not and should not await actual retirement. To postpone a special write-down in this situation would mean the avoiding of the recognition of a loss

already suffered and would be likely to lead to a padding of the operating charges (or losses) of the future."

Thus, assets should be written down when their earning capacity is permanently impaired or when they cease to have economic usefulness. The write-downs are treated as a loss and should be clearly reported as such in the income statement. The write-down of impaired assets is consistent with SEC requirements. If the sum of the undiscounted future cash flows will be less than the net book value of an asset, a write-down is recommended by general accounting practice.

Similarly, the traditional regulatory model recognizes that assets may become impaired and, therefore, requires that the net investment base be continually reviewed to purge from the investment base assets that are not used or useful. However, in contrast to professional accounting practice, this model requires scrutiny of write-downs to determine whether and in what manner their recovery should be allowed.

Both approaches rely on a certain degree of subjective judgment. The regulatory investigations are believed to be more impartial as the investigator has no direct financial interest. However, impartiality may not result in any material improvement in accuracy. The low expectation of improved accuracy, combined with the materially higher cost of

regulatory investigation, favors continued reliance on professional accounting practices and SEC guidance.

Examples of voluntary write-downs in the railroad industry were numerous in 1986 as five large railroads wrote down nearly \$2 billion in assets. Before these write-downs, the railroad industry had maintained that no material excess capacity existed. To the extent that material excess capacity still exists, the industry should identify and eliminate it from the investment base.

The RAPB has concluded that the write-down of excess railroad-related assets against operating income is appropriate if professional accounting practices are rigorously followed. However, the RAPB has recognized in its determination of other asset valuation issues that some of the alternative non-GAAP valuation methods (such as predecessor cost) may be seriously affected by excess assets. Moreover, small improvements in accuracy may be material. Future adoption of any of these alternative methods would require, therefore, additional analysis of the treatment of excess assets.

## **APPLICATIONS AFFECTED**

The Asset Valuation and Related Expense Principle affects all of the specific regulatory applications addressed by the RAPB.

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# CHAPTER 8

## Productivity Principle

### STATEMENT OF PRINCIPLE

To measure cost changes accurately, indices used for railroad regulatory purposes shall incorporate changes in productivity as well as changes in input prices.

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### EXPLANATION

Cost changes result from many factors, including price changes in purchased goods and services, changes in volume and mix of outputs, and changes in the consumption of goods and services required to produce the output. Productivity measurement is the comparison of the quantity of goods and services produced to the real quantity of resources used in producing those goods and services.

The concept of productivity is rooted in the notion of the "production function." The production function demonstrates that the physical volume of output depends on the physical volume of resource inputs used in the production process and on the efficiency with which they are used, i.e., on their productivity.

To measure change in productivity, change in some measure of output from some period is divided by the change in some measure of input for the same time period (Kendrick and Grossman, 1980). Productivity should measure the long-term trend in relative production efficiency over time. Productiv-

ity changes in the railroad industry occurring from quarter-to-quarter or year-to-year may be abrupt, often due to unpredictable changes in railroad transport-dominated markets. However, over longer periods of time, productivity changes tend to even out to a more consistent value than over a short period of time.

Because of possible short-term fluctuations of productivity, overall stability may be achieved by adjusting input price indices by a time trend of productivity that captures the long-term smoothness of railroad productivity change.

### Impact of Including a Productivity Measure

The following example shows the importance of reflecting productivity changes in the measurement of economically accurate costs.

Assume a railroad hauls coal from point A to point B with a cost of \$10 per ton. Input prices rise 4 percent in one year. The railroad obtains a labor agreement that permits it to operate crews more

efficiently. Thus, the labor hours required during the same year are reduced. The impact of the labor reduction lowers the total cost requirements by approximately 2 percent.

Assuming a base index of 1.000, an input price index would increase to 1.040 (the same value as a productivity-adjusted index which assumed zero percent productivity increase). Thus, using only input prices to measure cost changes, the railroad would measure the increased cost as being \$10.40 per ton ( $\$10.00 \times 1.040$ ).

However, taking productivity into account, the total increased cost per ton experienced by the railroad is only \$10.196 per ton, i.e.,  $\$10.00 \times (1.040/1.020)$ . The \$10.00 cost per ton is multiplied by the increased input price index of 1.040 and then divided by 1.020 to reflect the 2-percent productivity increase. Not adjusting for productivity overstates railroad cost increases beyond what is actually experienced.

## **ALTERNATIVES FOR INCLUDING PRODUCTIVITY MEASURES IN COST INDICES**

The RAPB considered the following three alternatives in connection with productivity and regulatory cost indices:

- Recommend that the ICC promptly implement an appropriate methodology to measure and incorporate productivity into input cost indices.
- Recommend that the ICC promptly implement a productivity measurement methodology specified by the RAPB to measure and incorporate productivity into input cost indices.
- Recommend that no productivity measure be incorporated into the cost indices.

The RAPB chose the first alternative, but modified the timing of implementation.

## **ANALYSIS OF ALTERNATIVES**

The arguments supporting the alternatives have been organized into the following sections:

- Economic Accuracy.
- Practicality.

## **Economic Accuracy**

Consistent with the objective of establishing principles to determine economically accurate rail costs, the RAPB believes a productivity principle is appropriate for two reasons:

- Exclusion implicitly assumes zero productivity change.
- Inclusion results in more economically accurate cost measurements.

These two reasons for including a productivity adjustment are closely related. By ignoring productivity changes, cost measurements affected by productivity changes reflect a zero productivity adjustment; however, not acknowledging productivity changes does not mean they do not exist. Rather, disregard of appropriate productivity adjustments results in questionable economic accuracy.

Productivity gains (or losses) affect cost measurement. It would be the exception, rather than the rule, that productivity would remain unchanged over a substantial period of time, especially since productivity improvements have been a significant goal of the railroads.

*Railway Age* (Welty, 1986) summarizes some of the railroads' efforts toward, and importance placed on, productivity:

"In all cases, improved productivity has been, and is, a major goal. Railroads still have a ways to go to be as productive as they might be. But with deregulation and with consolidation—by whatever form it's taking—the industry is getting better, more productive . . . Given the capital needs and in view of the intense nature of transportation competition, the industry cannot afford to let up in the search for still-higher productivity."

Annual reports of the major railroads also reflect the importance of productivity. For example, the 1985 Annual Report of the Union Pacific Corporation is typical of the emphasis placed on productivity. It states:

"the drive for increased productivity is seen in all phases of the Railroad's operations."

To meet competition and increase (or maintain) markets, railroads must cut costs and seek produc-

tivity growth. They are investing in computers and other technological advancements, increasing research budgets, and restoring track. With increasing competition and deregulation as motivators, the railroads are moving toward even more innovations and other productivity achievements.

In the final analysis, incorporating an appropriate productivity measurement with railroad regulatory input price indices results in more economically accurate cost indices. Therefore, to measure total changes in cost accurately, productivity must be included. The RAPB believes that by relying on existing work and presently available expertise, the ICC will be able to measure productivity and implement such a measure within 18 months of publication of the Railroad Accounting Principles.

### Practicality

Some commenters state that no overall standard of railroad productivity is acceptable for all purposes. They argue that the many existing and proposed measures of railroad productivity are inaccurate, unreliable, and unsound.

The economic community has recognized the difficulties of measuring productivity. In the paper, "Measurement of Productivity" prepared for the Conference on an Agenda for Economic Research on Productivity, 1973, Irving H. Siegel from the U.S. Department of Commerce observed that productivity measurement is:

"Dependent in its definition . . . and interpretation on [varying] concepts . . .

"Measurable only with the aid of many conventions that compromise the 'economic' . . . significance of the numerical results . . .

"Often not measurable in the manner prescribed by the algebra (because of data limitations), or even by satisfactory approximation because of methodological limitations, or not at all [since] the underlying output and input variables are not significantly quantifiable . . .

"Frequently measured as a composite (i.e., an average or index number) for which more than one representation is conceivable and algebraically feasible."

Anselin, et al. (1981) of the National Regulatory Research Institute has observed that productivity measures are constructed as an attempt to identify

changes in the level of production that cannot be explained by changes in the usage of the associated inputs and characteristics of the original production process. It is not easy to identify the causal factors accounting for observed productivity growth.

Past studies on railroad productivity by the Bureau of Labor Statistics (1971), John Kendrick (1973), and the Task Force on Railroad Productivity (1973) have arrived at different results (Brand, 1974). The Bureau of Labor Statistics (BLS), U.S. Department of Labor, using labor physical units and ignoring wage level gains, measured physical gains in railroad productivity of approximately 5 percent annually during the period 1950 to 1976. Similarly, Kendrick, using capital in addition to labor, demonstrated an annual average increase in railroad productivity of 5.2 percent between 1948 and 1966 (physical measure). However, the Task Force on Railroad Productivity, using alternative assumptions and measures, calculated a relatively conservative average annual increase in labor productivity of 3.7 percent between 1947 and 1970. The differences between these measures lie mainly in the different productivity concepts and approaches.

Economist Solomon Fabricant, summing up some of the difficulties surrounding productivity measurement, stated in an article entitled, "Problems of Productivity Measurement," in the book *Measuring Productivity* (1984):

"Economists do not always agree on the productivity concept best suited to a given objective; even when they do, they are not necessarily of one mind on the measurement that best conforms to the concept or provides the best compromise with inadequacies of the data."

Other economists have reinforced the view that the application of any one productivity measurement relevant for all purposes is unlikely. They view adoption of a particular measurement as a function of the use of that measurement. They believe that one productivity methodology for all railroad purposes is unlikely and unnecessary.

Because the question of an appropriate productivity measure has been raised by the commenters throughout the RAPB's tenure, the RAPB considered whether a particular productivity methodology should be recommended. Some commenters have stated that appropriate productivity measurements do exist and have proposed that the RAPB

endorse a particular methodology such as the total factor productivity measurement developed by Douglas W. Caves and Laurits R. Christensen, sampling particular movements or using series of productivity measurements. Other parties agreed with the Productivity Principle, but did not believe it could be applied practically. Some believed that the Caves/Christensen or other existing methodologies were deficient.

The RAPB's discussion of the Caves/Christensen methodology resulted principally from its status in a pending rulemaking in Ex Parte No. 290 (Sub-No. 4), *Railroad Cost Recovery Procedures—Productivity Adjustment*, where the ICC has directed attention to the approach. This discussion should not be construed as tacit endorsement or criticism of the Caves/Christensen methodology. The choice of an appropriate productivity measure is an ICC implementation issue.

The RAPB believes that the ICC can develop and implement an appropriate productivity measure within 18 months following publication of the Railroad Accounting Principles. In this regard, the BLS is developing a multi-factor railroad productivity measure, similar to the total factor concept. The BLS has stated that, if requested, it is able to develop a multi-factor railroad productivity measure in about one year. While the BLS effort may be helpful to the ICC, it is in no way a substitute for the ICC's own study of productivity.

An appropriate productivity adjustment is to be included in all indices designed to measure economically accurate cost changes.

## APPLICATIONS

The Productivity Principle addresses two applications: GPCS and RCAF.

## General Purpose Costing Systems

The Productivity Principle affects GPCS and all other applications in which GPCS are used. Cost indices are used to restate historic cost levels to present cost levels in the following two different applications:

- To adjust pooled cost data to a common base year for use in regression analysis.
- To index variable unit costs, derived from the costing process, from one period to a subsequent period.

Whenever costs from one period are to be adjusted through use of indices to represent the costs of another period, the Productivity Principle requires that the indices shall include an appropriate measure of changes in productivity. The Causality Principle requires that the productivity changes should be measured for the category of cost or type of traffic to which it is to be applied. However, the Practicality Principle may temper implementation of a productivity measurement: an average or estimated productivity measure may be used (for either cost effectiveness or materiality reasons).

## Rail Cost Adjustment Factor

The Productivity Principle also may affect the RCAF. The SRA neither requires nor precludes a productivity adjustment in the RCAF as a matter of law (see *Western Coal Traffic League v. United States*, 677 F.2d 915 (D.C. Cir.), cert. denied, 459 U.S. 1086 (1982)). Adjusting the RCAF for productivity is an issue which must be resolved by the ICC in rulemaking. The RAPB believes that an appropriate adjustment for productivity is necessary for the RCAF to measure cost changes accurately and that the ICC should implement an appropriate productivity adjustment in the RCAF. The application of the Productivity Principle to the RCAF is discussed in detail in Chapter 14, "Rail Cost Adjustment Factor."

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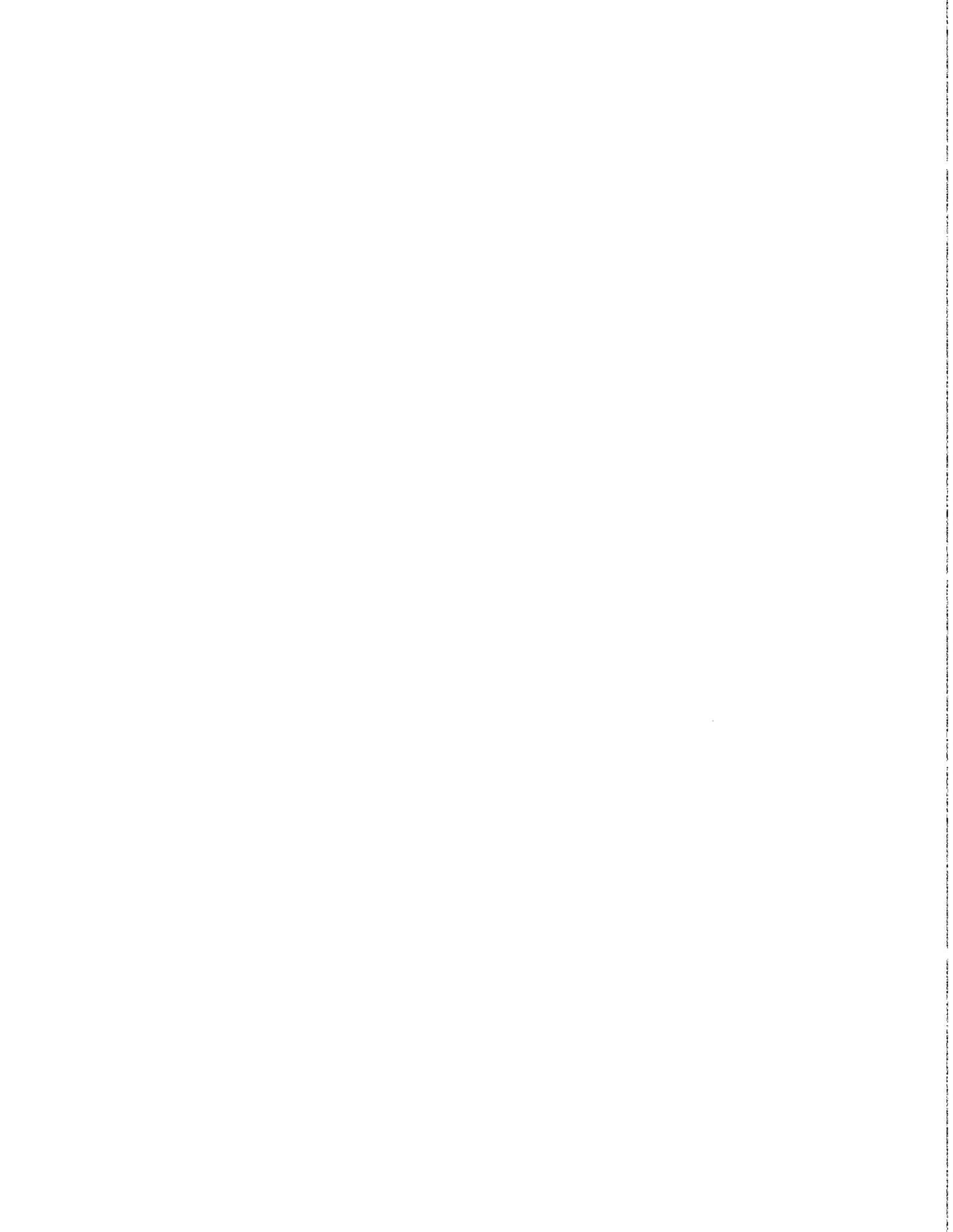
# **PART II**

## **Specific Applications**

This part of Volume 2 discusses the major specific regulatory applications under the jurisdiction of the ICC which will be affected by the Railroad Accounting Principles. The specific applications discussed in the following chapters are:

- Chapter 9 - Revenue Adequacy
- Chapter 10 - Maximum Rates
- Chapter 11 - Competitive Access
- Chapter 12 - Abandonment/Surcharge
- Chapter 13 - Minimum Rate/Long-Cannon
- Chapter 14 - Rail Cost Adjustment Factor

Each chapter contains an explanation of the regulatory application and discusses how the ICC currently carries out its responsibilities. Each chapter also identifies which of the eight Railroad Accounting Principles applies to the specific regulatory application and discusses the pros and cons of its application. Where appropriate, the chapter presents an analysis of alternatives applicable in specific regulatory circumstances. Also, it presents a discussion of the impact of implementing the Railroad Accounting Principles.



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# CHAPTER 9

## Revenue Adequacy

### EXPLANATION

The ICA requires the ICC to determine annually which railroads subject to its jurisdiction are earning adequate revenues. It states that adequate revenue levels should provide for the recovery of expenses and the attraction and retention of necessary capital for continued operations.<sup>7</sup>

The ICC has determined that a railroad has adequate revenues when its ROI equals or exceeds the cost-of-capital rate.<sup>8</sup> Thus, the RAPB's focus on revenue adequacy is limited to the economically accurate determination of railroad ROI and the cost-of-capital rate.

The RAPB has not considered the economic accuracy of alternative revenue adequacy standards not presently used by the ICC (such as funds flow, ratio analysis, and return on equity). However, should the ICC adopt a different revenue adequacy policy in the future, the RAPB intends that its Principles be applied to the extent they are relevant. For example, if the ICC selected return on equity as the revenue adequacy standard, the Entity and Asset Valuation and Related Expense Principles would apply

in their entirety, and the Cost of Capital Principle would apply in part.

### APPLICATION OF PRINCIPLES TO REVENUE ADEQUACY

Principles which apply to revenue adequacy determinations are:

- Causality,
- Practicality,
- Data Integrity,
- Entity,
- Asset Valuation and Related Expense, and
- Cost of Capital.

#### Causality

The time orientation concept in the Causality Principle is pertinent to revenue adequacy determinations. Because ROI for a period is used as a measure of the ability to attract capital in a competitive market place, it must be compared with the cost of capital in that market place for the same time period.

<sup>7</sup>49 U.S.C. 10704(a)(2).

<sup>8</sup>Ex Parte No. 393, *Standards for Railroad Revenue Adequacy*, 364 I.C.C. 803 (1981), aff'd *Bessemer & Lake Erie R.R. Co. v. I.C.C.*, 691 F. 2d 1104 (3rd Cir. 1982), cert. denied, 462 U.S. 1110 (1983). In a subsequent proceeding, docketed as Ex Parte No. 393 (Sub-No. 1) (served Dec. 31, 1986), the ICC reviewed the ROI standard, among other revenue adequacy-related matters, and reaffirmed its use as the single standard for determining revenue adequacy.

## **Practicality**

According to the Practicality Principle, ROI information may be submitted in condensed supplemental schedules rather than in full consolidated/combined reports. Accurate ROI computations for revenue adequacy purposes do not require the level of detail contained in annual reports to the shareholders, the SEC, and the ICC. However, ROI information should reconcile with annual report information in the sense that amounts can be traced.

## **Data Integrity**

According to the Data Integrity Principle, the data used to develop individual railroad ROI and the industry cost-of-capital rate require different approaches, described below, for assuring data integrity because they are obtained from different sources.

Each railroad entity's revenue, expense, and investment data are used to compute its ROI. These data are reported in the R-1 or, under the Entity Principle, in a condensed supplemental consolidated/combined schedule filed annually.<sup>9</sup> Since critical items of these reports are periodically audited using agreed-upon procedures by independent public accountants, these data may satisfy the Data Integrity Principle for revenue adequacy purposes by relying on established standards.

Unlike ROI data, which are filed with the R-1, information used to determine the industry cost-of-capital rate is submitted in an annual Ex Parte proceeding. This information is based on samples and estimates of market debt and equity costs. Data integrity for cost-of-capital rate determinations may be accomplished through established ICC procedural rules regarding the presentation and support of evidence.

## **Entity**

The Entity Principle defines the portion of potentially complex conglomerate organizations which represent railroad-related business enterprises. The railroad entity provides the boundaries for measur-

ing revenue, expense, and the asset base for ROI computations.

For revenue adequacy purposes, the ROI calculation is based on the railroad-related activities of affiliated railroads and their railroad-related affiliates. This entity represents the business enterprise undertaking railroad-related activities rather than a legal entity.

The Entity Principle describes which activities are considered railroad-related and how affiliation is determined. Railroad-related activities are those which support railroad operations. Affiliation is determined in accordance with GAAP.

Accurate railroad-related ROI measurements should include only the assets used in railroad-related activities and the revenues and expenses resulting from their use. Conversely, ROI measurements should exclude nonrailroad-related assets, liabilities, revenues, and expenses. However, according to the Practicality Principle, ROI measurements either may include or exclude all of an affiliate's assets, revenues, and expenses depending on whether (1) segregation is impractical and (2) the affiliate is predominantly railroad-related. An affiliate is predominantly railroad-related if it could not exist but for the revenue derived from or the support provided for railroad operations.

Because practicality considerations may result in the exclusion of entire railroad-related affiliates, railroad-related transactions between the railroad entity and affiliated companies outside the entity may occur. To include the economic effect of such transactions between the railroad entity and affiliated companies outside the entity, the transactions should be stated at fair market value in computing ROI. Railroad-related transactions with companies outside the railroad entity may produce gains or losses which should be included in ROI computations.

## **Asset Valuation and Related Expense**

Once the boundaries of the railroad entity are determined, the entity's assets must be valued to produce

<sup>9</sup>Even though the Entity Principle requires consolidated or combined reporting of activities of affiliated railroads and their railroad-related affiliates, the current R-1 does not report data in this manner for some railroad entities. The Practicality Principle states that information required for revenue adequacy may be reported in condensed supplemental schedules rather than in full consolidated financial reports.

the denominator for ROI. The Asset Valuation and Related Expense Principle, as applied to revenue adequacy, provides for asset valuation in accordance with GAAP. However, if the ICC determines that acquisition cost is not a meaningful measure of value in a particular case, other measures of value may be used, including predecessor cost.

According to the Asset Valuation and Related Expense Principle, the entity's deferred tax credit balance must be subtracted from its investment base. Unlike debt and equity sources of funds, deferred tax credits are a zero cost source of funds. Since the purpose of a revenue adequacy determination is to ascertain whether a railroad entity is earning revenues sufficient to attract and retain capital, that portion of the investment base which is financed through deferred taxes should not be included in the ROI.

The "return" comprising the ROI numerator is also affected by the Asset Valuation and Related Expense Principle. The return computation incorporates, among other expenses, the annual depreciation expense associated with the asset base.

### **Cost of Capital**

As mentioned previously, the industry-wide cost-of-capital rate is the standard against which ROI generally is compared to determine revenue adequacy. As such, it represents the return required to attract and retain capital necessary for the provision of a sound rail transportation system in the United States.

The Cost of Capital Principle describes the components and the method by which they are combined to produce a weighted average rate expressed as a percentage. The cost-of-capital rate is a nominal rate comprised of market debt and equity costs weighted by their proportions of the railroad industry's market-valued capitalization. The debt and equity capitalization portions are determined for a single year.<sup>10</sup>

## **ANALYSIS SUPPORTING/REJECTING CHANGES TO THE APPLICATION**

Alternatives affecting revenue adequacy determinations were considered by the RAPB in developing

the Entity, Asset Valuation and Related Expense, and Cost of Capital Principles.

### **Entity**

Of four alternative entity definitions for revenue adequacy, the RAPB selected the broadest: combined railroad-related activity. Chapter 5, "Entity," contains a detailed discussion of the entity alternatives; that discussion will not be repeated here. However, to summarize briefly the reasons for the selection, the RAPB concluded that the combined railroad-related entity was superior to the other narrower alternatives for the following reasons:

- It represents the economic entity performing railroad-related activities rather than a management or legal structure. The RAPB entity is compatible with the measurement of performance of railroad activities and is consistent with the economic entity concept in financial accounting (given the limited regulatory scope).
- It reduces the potential effect of manipulation through transfer of economic wealth within the family of interests which includes the regulated entity. In consolidating/combining railroad-related affiliates, the economic effect of transfers between these companies are eliminated. Thus, the significance of asset transfers and of transfer pricing of materials and services is reduced.
- It results in more cost effective report preparation than the ICC R-1 entity or the operating entity. Although the entity adopted by the RAPB may result in slightly higher reporting costs than the alternative consolidated entity, the entity adopted by the RAPB produces greater economic accuracy for railroad regulatory application. Moreover, these additional reporting costs may be reduced by submitting condensed supplemental schedules and by including or excluding entire railroad-related affiliates when separating the railroad-related activities is impractical.
- It enhances the ability to rely on internal controls and audit coverage required for external financial reporting. The affiliates to be consolidated are already subject to external audit and, therefore, may be more easily reconciled with the existing financial reports.

<sup>10</sup>Ch. 6 contains an in-depth discussion of the derivation of the components and the construction of the weighted cost-of-capital rate.

- For some railroads, it more closely resembles the entity which enters capital markets than narrower entity alternatives. Since measuring the ability to attract and retain capital in competitive capital markets as a result of railroad operations is the objective of revenue adequacy determinations, the entity should be defined to measure the performance affecting this ability. The resulting railroad entity enhances comparability between the railroad industry and other industries.

### **Asset Valuation and Related Expense**

Asset valuation cannot be isolated from cost-of-capital rate determination. A current-cost asset base requires either the use of a real cost-of-capital rate or the recognition of capital gains or losses for the period of time in which assets are held. Conversely, a historical-cost asset base requires the use of a nominal cost-of-capital rate to account for inflation in capital costs. Since both the asset valuation and the cost-of-capital rate include the impact of inflation, a nominal cost-of-capital rate used in conjunction with a current-cost asset base would result in a double count of inflation in capital costs.

The RAPB considered current market value<sup>11</sup> and historical cost<sup>12</sup> as the basis for asset valuation. It selected historical cost net of accumulated depreciation.

The argument for current market value valuation is that this methodology is consistent with economic principles which value assets in terms of opportunity cost. In most cases, opportunity cost is measured by the replacement cost of assets with similar remaining productive lives and capacity.

An argument for historical cost valuation is that it is used by the financial community to evaluate financial viability of all industries competing for capital in the market place. Since measurement of the ability to attract and retain capital in competitive capital markets is the purpose of revenue adequacy determinations, historical valuation is appropriate.

Another argument for historical cost valuation is that such costs are more verifiable than current market value estimates. Proponents of historical valuation state that severe practical problems are encountered in accurately estimating the current market value of the asset base and in estimating the real cost-of-capital rate.

The RAPB believes that current market valuation is preferable to historical valuation from a theoretical economic viewpoint. In revenue adequacy applications, current market value represents the value upon which competitive returns must be earned to attract and retain capital. Moreover, directly accounting for capital cost inflation in asset valuation reduces potentially significant variations between asset-specific inflation rates and economy-wide inflation rates encompassed in nominal cost-of-capital rates used in conjunction with historical asset valuation.

However, the RAPB believes that serious practical problems are encountered in applying current market valuation for revenue adequacy determinations:

- Unlike most other regulatory applications, revenue adequacy determinations require valuation of the asset base for the entire railroad entity.<sup>13</sup>
- While historical asset valuation may be determined directly from the entity's regularly maintained accounting records, current market valuation requires identification of the value of the remaining productive capacity of an entity's assets. This information is not regularly maintained in the entity's accounting records.
- The revaluation task is complicated by the need to identify and revalue existing assets which will not be replaced. In addition, other assets will not be replaced in kind. Rather, they will incorporate technological changes.
- Depreciation expense associated with current valuation must be derived to reflect the composition and life expectancy of a current cost asset base.

<sup>11</sup>Actually, three current approaches were considered: Reproduction Cost, Replacement Cost, and NLV. Ch. 7 contains a description of each of these approaches.

<sup>12</sup>The term "historical" asset valuation, as used here, corresponds to GAAP valuation. Alternative historical cost methods considered were acquisition and predecessor cost (see Ch. 7, p. 39).

<sup>13</sup>Most other regulatory applications, such as maximum rate costs, competitive access costs, and branch-line abandonment costs, pertain to specifically identified portions of the railroad entity, not the entire railroad entity. Thus, practical measurement problems are not as severe.

- A reliable real cost-of-capital rate, required in conjunction with a current cost asset base, is difficult to compute accurately. This problem is addressed further in the following section.

### **Cost of Capital**

The RAPB considered numerous issues pertaining to cost-of-capital rate determination. Since the alternatives considered for each issue and the reasons for accepting or rejecting them are presented in Chapter 6, the RAPB focuses here on the alternative measurement methodologies that significantly influenced its selection.

Of the three alternative cost-of-capital rate measurement methodologies considered—traditional, current nominal, and real—the RAPB selected the current nominal cost-of-capital rate for four reasons:

- A substantial portion of the railroad industry's traffic base is no longer subject to ICC regulation. As a result, a large share of the industry's revenues are determined by competitive markets rather than through the regulatory process. Under the traditional approach, if current market debt rates exceed embedded debt rates, regulatory lag may preclude subsequent recovery of debt costs on competitive traffic.
- The opportunity cost concept employed in determining equity costs is also applicable to debt costs since railroad entities must earn the competitive market cost of debt to attract capital adequately.
- This methodology is compatible with the RAPB preference for measuring cost of capital on an industry basis for revenue adequacy purposes. Embedded debt costs may vary significantly among railroads, depending on the age composition of each railroad's debt.
- For practicality reasons, compensating for inflation through the use of a current nominal rate is preferable to use of a current cost asset base and

a real rate. Computation of a real cost-of-capital rate requires an estimate of the expected rate of general inflation which cannot be observed.

### **EFFECTS OF IMPLEMENTATION**

Application of RAPB Principles to revenue adequacy determinations results in five departures from current ICC practices.<sup>14</sup>

#### **Definition of Control**

One of the current ICC criteria for determining whether a subsidiary qualifies for inclusion in the railroad entity for revenue adequacy purposes is that the Class I railroad must own a majority interest in the subsidiary.

Control may exist even where majority ownership is not present. By defining affiliation in conformance with GAAP, the Entity Principle incorporates the GAAP concept of control rather than the majority ownership requirement of the ICC. For financial statement presentation, FASB is presently considering inclusion of affiliates which are less than majority owned. By determining affiliation as defined by GAAP, the Entity Principle permits flexibility to incorporate alternative measures of control which may be required in the future.<sup>15</sup>

The ICC presently requires consolidation/com-bination of Class I railroads that are under common control only if they form a unified, jointly managed system. The Entity Principle does not include this jointly managed condition for consolidation/com-bination. Whether elimination of this condition would result in a significant change in the present ICC entity for revenue adequacy is unclear.

#### **Inclusion of Activities Presently Excluded by the ICC**

The railroad entity presently defined by the ICC includes only railroads and subsidiaries of Class I railroads. The railroad entity defined by the Entity Principle includes affiliated railroads and their

<sup>14</sup>Current ICC practices considered here represent changes resulting from the ICC's decision in Ex Parte No. 393 (Sub-No. 1), *supra*.

<sup>15</sup>GAAP on this issue is governed by AICPA Accounting Research Bulletin No. 51, "Consolidated Financial Statements," which relies on majority ownership of a voting interest to determine controlling financial interest. A recent FASB exposure draft, "Consolidation of All Majority-Owned Subsidiaries," Dec. 16, 1986, states that the FASB is researching and deliberating on how to determine if means other than majority ownership result in control, but more consideration is needed before the FASB can reach tentative conclusions on this issue.

railroad-related affiliates. For example, the railroad entity defined by the Entity Principle may include subsidiaries of the holding company that would not be included by the ICC's definition.

The ICC does not include the results of noncontrolled interests for revenue adequacy purposes.

### **The "But For" Test**

Another of the current ICC criteria for determining whether a subsidiary qualifies for inclusion in the railroad entity is that a subsidiary's activities must be integral to the railroad's operations. If, "but for" the existence of the subsidiary, the railroad would have to create an operation to provide equivalent goods or services, the subsidiary is considered to be integral to the railroad's operations and is included in the railroad entity.<sup>16</sup>

While the Entity Principle does not include a "but for" test, its practical application uses a "but for" test. However, in defining the entity, both the RAPB's "but for" test and the point at which it applies, are different from the test used by the ICC.

To pass the "but for" test described by the RAPB, the revenue derived from or the support provided for railroad operations must be essential for the affiliate's existence. To pass the ICC's "but for" test, the operation, goods, or services provided by the

railroad subsidiary must be essential for the railroad's operations.

To illustrate the difference between the two "but for" tests, assume a railroad owns and operates car repair facilities within the railroad company and also controls a subsidiary company which repairs cars for the parent railroad as well as for other nonaffiliated railroads. Further, assume that if the subsidiary company did not exist, the portion of the parent railroad's repairs which are presently performed by the subsidiary would be performed by distributing the work to the parent railroad's other repair facilities. The subsidiary company could fail a strict interpretation of the present ICC "but for" test because the railroad would not be required to create an operation to provide equivalent services. However, it would pass the RAPB's "but for" test, assuming the subsidiary company derived substantial revenue from the parent railroad, without which it could not exist.

### **Use of GAAP Cost**

The Asset Valuation and Related Expense Principle requires that assets be valued at GAAP cost for revenue adequacy determinations. However, the ICC may determine that GAAP cost is not a meaningful measure of value in certain circumstances and may elect to use another measure, such as predecessor cost.

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<sup>16</sup>Ex Parte No. 393 (Sub-No. 1), *supra*.

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# CHAPTER 10

## Maximum Rates

### EXPLANATION

The ICA requires that rates subject to ICC jurisdiction must be reasonable.<sup>17</sup> However, it does not specify the manner in which the ICC shall evaluate maximum rate reasonableness. Rather, it leaves to the ICC the authority to establish standards and guidelines which will apply to such determinations.

Presently, the ICC has not established a comprehensive policy regarding its use of cost evidence in assessing maximum rate reasonableness for non-coal commodities. In the past, the ICC has relied on various types of evidence, including evidence of revenue-cost relationships. This cost evidence has included variable costs, fully allocated costs, and stand-alone costs (SAC) based on a variety of approaches and incorporating a range of cost-of-capital levels. The ICC has considered cost evidence, along with other evidence, on a case-by-case basis.

In *Ex Parte No. 347 (Sub-No. 1), Coal Rate Guidelines—Nationwide*, the ICC adopted SAC as the

appropriate cost test for maximum rate reasonableness cases involving movements of coal.<sup>18</sup> SAC, also called simulated competitive market price, is the cost at which an efficient competitor, in a market free of special entry and exit barrier costs, could provide the service covered by the challenged rate.

While other cost information may be relevant to maximum rate reasonableness determinations under the ICC's "Constrained Market Pricing" (CMP) guidelines, SAC is the sole cost test for maximum rate reasonableness of coal transportation rates.<sup>19</sup>

In rate reasonableness cases for traffic other than large movements of coal, the ICC has proposed two alternative standards in addition to a full CMP presentation. The alternative standards, proposed in *Ex Parte No. 347 (Sub-No. 2), Rate Guidelines—Non-coal Proceedings*, are intended to provide less burdensome means of achieving the CMP results since the ICC believes that CMP is the most sophisticated and accurate method for determining maximum rate reasonableness.<sup>20</sup> Because these standards have not been adopted at the date of this

<sup>17</sup>49 U.S.C. 10101a(6) and 10701a(b)(1).

<sup>18</sup>1 I.C.C. 2d 520 (1985).

<sup>19</sup>In *Ex Parte No. 347 (Sub-No. 1), supra.*, the ICC adopted a four-part CMP test. The four constraints were (1) revenue adequacy, (2) management efficiency, (3) SAC, and (4) phasing of rate increases.

<sup>20</sup>*Ex Parte No. 347 (Sub-No. 2), Rate Guidelines—Non-coal Proceedings*, served Apr. 8, 1987, pp. 1–2. The two proposed simplified standards are Formula Replacement Costs and Revenue to Variable Cost Ratios. The ICC also requested comments on the use of Final Offer Arbitration and Competitive Access as optional approaches to resolving rate reasonableness disputes.

report, they will not be specifically addressed by the RAPB.

Other applications of maximum rate cost evidence, such as those presented in past ICC cases, suggested to the RAPB by commenting parties or proposed by the ICC in Ex Parte No. 347 (Sub-No. 2), involve the computation of variable costs or a surrogate for stand-alone costs. These applications typically are based on GPCS, such as RFA or the URCS, with adjustments to incorporate movement-specific cost information and operating characteristics consistent with the RAPB's Principles. Similarly, when SAC are used, the ICC may have to allocate the excess of revenues over total SAC in determining rate reductions for individual members of the stand-alone shipper group, but these allocations are a rate-setting task, not a costing problem.

Railroad Accounting Principles apply whenever costs are used in maximum rate cases. However, their application may vary among specific maximum rate cases, depending upon the type of costs which the ICC requires to make its rate reasonableness decisions. For example, for practicality reasons, the Asset Valuation Principle is applied differently for SAC than for variable costs from GPCS. The Principle requires current market asset valuation for SAC, but it permits other measures of cost for GPCS.

This chapter's explanation of how the Principles apply in maximum rate cases pertains specifically to SAC, since the ICC's CMP guidelines for coal include a SAC test. The explanation is based on the ICC's current CMP guidelines; it may require modifications for subsequent ICC departures from these guidelines.

## **APPLICATION OF PRINCIPLES TO MAXIMUM RATE CASES**

In computing SAC for use in maximum rate cases, all of the Principles may apply. This section addresses the application of those Principles which are likely to be most useful in preparing SAC evidence.<sup>21</sup>

### **Causality**

The Causality Principle, as applied to SAC, allows the inclusion of costs which would be incurred by

the hypothetical competitor to provide service to the shipper or group of shippers.

This Principle permits a causal relationship to be established through direct observation, engineering analysis, and/or statistical techniques.

As applied to SAC, each of the three approaches differs in its underlying assumptions. Direct observation typically focuses on a specific portion of an existing railroad's facilities and operations as a surrogate for the facilities and operations of a hypothetical competitor. Engineering analysis is based on general physical relationships between the quantity and mix of input resources required to produce a specific quantity of output rather than relying on surrogate cost information from a particular existing railroad. Statistical techniques typically are applied in GPCS to produce railroad-wide average unit costs as a surrogate for the unit costs of a hypothetical competitor.

The RAPB has not established a hierarchical preference among the approaches for establishing causality. However, where historical railroad costs are used in direct observation or in statistical techniques, caution should be exercised to ensure that the physical and operating characteristics of the surrogate railroad comport with those of the hypothetical competitor.

The Causality Principle discourages apportionment or allocation of joint costs among activities where the relationship between the incurrence of cost and the joint performance of activities is inseparable among the activities. In determining costs for the stand-alone competitor, such allocations may be avoided by determining costs for the entire stand-alone entity. If the revenues for the traffic to be handled by the stand-alone competitor exceed the total SAC, then maximum reasonable rates must be set by the ICC.

The Causality Principle recognizes that costs may apply in the short-run, intermediate-run, or long-run, depending on the specific regulatory application. In SAC applications, relevant costs are typically long-run costs since the relevant time period for a hypothetical competitor considering entering

<sup>21</sup>One commenting party stated that SAC should never be the end point in maximum rate regulation. Rather, SAC should be considered, in conjunction with actual direct cost of service, as a means of allocating common costs among users of rail facilities. The weight afforded SAC or its particular application in setting maximum rates are matters of ICC regulatory policy rather than of economically accurate cost determination.

a market is the expected life of the stand-alone entity's operation. The expected life depends upon the assumptions made regarding the period over which the stand-alone railroad's traffic is expected to move.

### **Homogeneity**

Average costs should be computed for interchangeable resources according to the Homogeneity Principle. Many costs for a hypothetical competitor exhibit interchangeability since no expenses have actually been incurred and no assets have actually been acquired. Average costs for interchangeable resources may be used both in direct observation of existing operations, as a surrogate for hypothetical operations, and in engineering methods.

Stand-alone locomotive repair cost projections, based on historical coal pool locomotive repair experience, provide an example of homogeneity. While repair information for the specific units actually used to handle a complainant's coal movements may be specifically identified, the average pool repair costs should be used if all coal pool locomotives have an equal chance for use in the complainant's movements.

### **Practicality**

The Practicality Principle offers guidance on computing SAC relevant to the size of the rate case. It recognizes that detailed engineering analysis for a complex stand-alone railroad network conceivably could exceed the potential transportation cost savings for a shipper. For the preparation of SAC to be feasible in such cases, the Practicality Principle allows reasonable estimates when necessary.

### **Data Integrity**

Because costs for a hypothetical competitor are necessarily estimates which reflect a degree of judgment, under the Data Integrity Principle they must be supported either by underlying source records or an explanation of the rationale and key assumptions regarding such judgments. Discovery and rebuttal procedures used in adversarial proceedings are appropriate mechanisms to ensure data integrity.

### **Entity**

The entity for SAC is the transportation network required by the new hypothetical competitor.

### **Cost of Capital**

Capital costs, typically an important component of SAC, consist of three major components: cost-of-capital rate, asset valuation, and capital recovery. These three components are determined by the Cost of Capital Principle and the Asset Valuation and Related Expense Principle.

The cost-of-capital rate is determined by the Cost of Capital Principle. For SAC, a nominal cost-of-capital rate, comprised of the weighted average of the current cost of debt and equity capital, is the appropriate discount rate when DCF analysis is used.<sup>22</sup> If the most practical method to perform this analysis—an after-tax cost-of-capital rate—is used, neither the cost-of-capital rate nor the asset base require adjustment for deferred taxes. Cash-flow effects of taxes are recognized directly in the cash-flow computations. The cost-of-capital rate should reflect the financial risk of the hypothetical competitor. However, if the computation of such a rate is impractical, the ICC-determined national rate may be used.

As noted by one commenting party, if an approach other than DCF is used, care must be taken to avoid double counting inflation in capital costs.

### **Asset Valuation and Related Expense**

In applying the Asset Valuation and Related Expense Principle to SAC, current market valuation at the time of entry, excluding special entry and exit barrier costs, should be used.<sup>23</sup> Current market valuation does not require that the new competitor acquire all new assets. Theoretically, a new competitor could acquire assets of mixed vintages similar to those of the existing railroad. However, the current market valuation of assets with similar productive capacity and remaining lives, rather than their historical cost, is the relevant valuation for SAC.

For example, if a complainant chooses to include the costs of used rail in its stand-alone railroad,

<sup>22</sup>See Ch. 6, "Cost of Capital," for a discussion of why the RAPB adopted a nominal rate and rejected a real rate.

<sup>23</sup>Special entry barrier costs are costs that would be incurred by a new entrant competitor but would not be incurred by the existing railroad due solely to the order of market entry. Exit barrier costs are sunk costs that the entrant competitor would incur even if it exited the market. For example, statutorily imposed employee compensation guarantees may represent an exit barrier.

such costs must be at current market prices for rail of the designated age, and its expected remaining useful life should be recognized accordingly. The resulting rail costs would comprise those costs which must be recovered to induce entry by a hypothetical competitor.

In most cases, capital recovery (the annual return of and return on assets) should be determined by estimating the annual cash flows that, when discounted using the after-tax nominal cost-of-capital rate, recover the original asset value. This capital recovery methodology, known as the DCF approach, requires the exclusion of noncash expenses, such as depreciation and deferred taxes, from the annual cash-flow computations.

While the DCF method is the preferred approach, other appropriate methods may be used. For any method, the time value of money must be recognized.

## **ANALYSIS SUPPORTING/ REJECTING CHANGES TO THE APPLICATION**

The Cost of Capital and Asset Valuation and Related Expense Principles required a selection from among alternatives with specific application to SAC.

### **Cost of Capital**

The cost-of-capital rate is an integral component of capital costs in SAC computations. The RAPB's rationale in selecting the current nominal cost-of-capital rate for all cost applications is discussed in Chapter 6, "Cost of Capital" (see p. 33).

The treatment of deferred taxes in SAC computations was mentioned by several commenting parties who suggested that the benefits of deferred taxes should be reflected by reducing the revenue requirements of the stand-alone competitor.

Alternative treatments of deferred taxes in SAC considered by the RAPB and discussed in Chapter 7 were:

- Incorporate deferred taxes as a zero-cost component in the cost-of-capital rate.

- Deduct deferred taxes from the hypothetical competitor's asset base.
- Directly recognize the tax consequences in a DCF analysis.
- Recognize tax expense using comprehensive inter-period tax allocation method (see p. 43).

The third alternative was preferred by the RAPB since a potential investor would include only the cash-flow effects of taxes in an investment analysis ignoring noncash deferred taxes. The other alternatives which recognize deferred taxes imply that deferred taxes comprise a predetermined fixed portion of the investor's asset base. These assumptions may not be appropriate for a new entrant. The alternative of using comprehensive inter-period tax allocation would overstate the revenues required to induce a potential investor to enter a market.

### **Asset Valuation and Related Expense**

Commenters were divided regarding whether historical or current market valuations should be used in SAC. Several commenters supported the exclusive use of current market valuations. Other commenters suggested that the use of either valuation approach was acceptable as long as inflation was not recovered twice. One commenter suggested that historical costs of the existing railroad should be used as a ceiling for sunk investments to prevent including entry barrier costs in SAC.<sup>24</sup>

The use of current asset valuations in SAC is theoretically appropriate. Because SAC represents the costs incurred by a hypothetical new competitor, asset valuations are prospective in nature. Asset costs borne by the defendant railroad in the past are irrelevant except to the extent that they may be used to estimate or verify the asset costs used in SAC determinations or to the extent that they pose special entry or exit barrier costs.

In addition, practical problems associated with using current market valuations in general company-wide applications are likely to be diminished in SAC analysis. Because the scope of the stand-alone competitor's network is likely to be less than the defendant's entire railroad system, the assets valued are hypothetical rather than actual. Consequently, spe-

<sup>24</sup>In this context, sunk costs are those costs which, once expended, cannot be reversed by the cessation of the activity they make possible. See Verified Statement in Ex Parte No. 347 (Sub-No. 1) of William J. Baumol and Robert D. Willig on behalf of five railroads (July 28, 1983), p. 23.

cific railroad assets do not need to be identified and valued.

The potential problem of double counting for inflation in capital costs can be avoided by applying a DCF capital recovery methodology. That methodology determines starting revenue so that cash flows, when discounted by the nominal cost-of-capital rate, exactly recover the investments. (An example of applying the DCF methodology is presented on p. 69.)

Several commenting parties addressed problems associated with entry and exit barriers, the sunk nature of many railroad capital costs, and the relevant lives for capital recovery in a SAC analysis. One party stated that the difference between costs which were sunk in the past by an existing railroad and costs which must be sunk by hypothetical entrants may pose special entry barriers. Another party stated that capital recovery of long-lived assets over a relatively short time period, coinciding with the life of the traffic at issue, may result in the overstatement of investment costs.

The RAPB believes that the problems tend to be interrelated. An investment cost is not sunk if its remaining economic value can be recovered upon exit from the market. In such a case, the life of the stand-alone railroad is irrelevant. Conversely, an investment cost is sunk if it cannot be recovered upon exit from the market. Nevertheless, sunk investment costs incurred by both the existing railroad and the hypothetical entrant must be recoverable to induce entry. Recovery of sunk investment costs by the existing railroad over one time period and by the hypothetical entrant over a different time period imposes different capital costs on incumbents and entrants.

From the RAPB's perspective, the treatment of entry and exit barrier costs in SAC analysis must be separated between issues that are a matter of principle and issues that address detailed implementation of the Principles. As a matter of principle, the exclusion of entry and exit barrier costs is necessary for SAC to conform with the contestable markets theory upon which the use of SAC as a maximum rate tool is based. However, acceptable approaches to identifying and quantifying such barriers may be numerous. The best approach depends upon the

unique circumstances of each case. Consequently, in the RAPB's view, choosing among suggested methodologies for determining entry and exit barrier costs is an implementation matter appropriately addressed in each case by the ICC.

According to one commenting party, a compensated transition must be implemented if the ICC changes asset valuation approaches for maximum rate regulation.<sup>25</sup> The party argued that, historically, the ICC has used original cost asset valuation for maximum rate regulation. By adopting current market asset valuation (e.g., trended net original cost) in SAC, the ICC has changed valuation approaches.

Compensated transitional mechanisms are not included in the Railroad Accounting Principles since the RAPB's focus is limited to establishing principles to guide SAC computations. The transition issue does not pertain to the computation of economically accurate SAC. Rather, it is an implementation mechanism directed toward alleviating perceived inequity resulting from moving from one regulatory policy to another. If the RAPB's Principles are likely to result in economic dislocation or inequitable treatment of certain railroads or shippers, transitional mechanisms may be instituted by the ICC to alleviate these problems. However, transitional mechanisms are independent from the computation of economically accurate costs.

### **Capital Recovery**

Two capital recovery methods—the utility method and the DCF method—were considered by the RAPB.

Under the utility method, capital costs are determined each year by multiplying the net depreciated asset base times a cost-of-capital rate and adding to this figure an annual depreciation expense (usually based on straight-line depreciation).

Under the DCF method, also called the capital budgeting approach, a profitable investment or venture must produce cash flows which, when discounted at the cost-of-capital rate, equal or exceed the initial cash outlay.<sup>26</sup> When used for maximum rate purposes, the cumulative present value of cash flows must equal the hypothetical competitor's initial cash outlay since returns in excess of the cost of capital are not permitted.

<sup>25</sup>Comments addressing this issue used the term "compensated switch." The RAPB has substituted the term "transition" for "switch" to avoid confusion with railroad operating terminology.

Annual cash-flow components under the DCF approach are not necessarily level. For example, annual cash flows may be established to recognize the tax effects of accelerated depreciation. They also may recognize expected inflation, changes in the productivity of assets, and changes in demand.

Assuming that rates are based on costs, the time pattern of capital recovery will differ between alternative approaches. The time pattern under the utility approach is one of high capital costs in an asset's early years and relatively low capital costs in its later years. The time pattern under the DCF approach depends on the productivity of an asset over time. If the productivity of an asset is constant over its life, the DCF approach produces a level annuity; if the productivity declines evenly over time, the DCF approach may conform more closely with the utility approach.

The difference between the two approaches is illustrated by considering two railroads, one with entirely new assets and one with the same type of assets comprised of mixed vintages and valued at current market cost. Under the utility approach, the railroad with entirely new assets will exhibit higher capital costs in the first year than the railroad with mixed assets. Under the DCF approach, if the productivity of the assets for both railroads is constant over their entire lives, other things being equal (such as tax depreciation), both railroads would have the same capital costs. In the DCF case, relative vintages of the railroads' assets are immaterial.

If the productivity of assets for both railroads declines evenly over time, the DCF approach will produce annual capital charges similar to those previously described under the utility approach.

The RAPB prefers the DCF approach in SAC analysis since it permits a flexible time pattern of capital recovery according to the configuration of the hypothetical competitor. This flexibility may be necessary so that the hypothetical competitor may earn a current market rate of return on the opportunity cost value of its investment.

The relevant pattern of capital recovery must be that which yields market returns on the current

market value asset base over the competitor's relevant life. Since exit barriers do not exist in SAC, a pattern of capital recovery which will not allow the hypothetical new entrant to earn a competitive return on the assets employed, valued at their opportunity cost, will result in liquidation of the investment and exit from the market.

The absence of exit barriers suggests that the capital recovery patterns may not conform to those generated under the utility method or any other predefined method of capital recovery. The possible inability of the hypothetical competitor to recover relatively high capital costs in the early years under the utility method may preclude use of the utility capital recovery pattern. Conversely, the possibility of traffic volume declining in the stand-alone competitor's later years might not permit capital recovery patterns which reflect relatively high capital costs in later years.

An example of a DCF approach, incorporating the application of the Cost of Capital and Asset Valuation Principles, is shown in Figure 1 on the following page. In this example, starting revenue is set in such a way that, when indexed at an expected inflation rate, the present value of the resulting cash flows over the life of the assets equal the original asset base investment.<sup>27</sup>

According to several commenting parties, the RAPB should neither endorse nor prescribe a specific SAC methodology. Rather, the RAPB should allow flexibility in computing SAC because (1) each maximum rate case may involve particular circumstances which are unique and (2) application is relatively new and, as a result, is still evolving.

The RAPB does not intend to prescribe a detailed DCF computational methodology nor does it intend to preclude the use of alternative capital recovery methodologies which are consistent with the Railroad Accounting Principles. To accommodate particular circumstances and assumptions in each case, the RAPB recognizes that the specific computational methodology, consistent with its Principle, must be flexible. The following example represents only one of many possible capital recovery applications to SAC.

<sup>26</sup>DCF analysis also includes the negative cash flows from operating expenses. However, the discussion here focuses solely on capital recovery since annual operating expenses could be recovered separately under any SAC methodology.

<sup>27</sup>In the example in Figure 1, starting asset base, operating cost, inflation rate, nominal cost of capital, and the number of years for the cash flow are assumed. Derivation of the other numbers in the example are contained in the figure and its footnotes.

Figure 1

**EXAMPLE OF DISCOUNTED CASH FLOW APPLICATION  
TO STAND-ALONE COST**

|  |                         |             |                                       |        |
|--|-------------------------|-------------|---------------------------------------|--------|
|  | Original Asset Base     | \$5,000,000 | Inflation Rate                        | 5.00%  |
|  | Starting Revenue/SAC    | \$1,547,362 | Nominal Cost of Capital <sup>28</sup> | 10.00% |
|  | Starting Operating Cost | \$1,000,000 | (used as discount rate)               |        |

| Yr.<br>(1) | Revenue/<br>SAC<br>(2)<br>(inflated) | Opcr. <sup>29</sup><br>Expense<br>(3)<br>(inflated) | Tax <sup>30</sup><br>Depr.<br>(4)<br>(a*g <sub>k</sub> ) | Current<br>Tax<br>Expense<br>(5)<br>(2-3-4)*tr | Cash<br>Flow<br>(6)<br>(2-3-5) | Present<br>Value<br>C.F.<br>(7)<br>(7) | Cum.<br>P.V.<br>(8)<br>(8) |
|------------|--------------------------------------|---|--|--|--------------------------------|--|----------------------------|
| 1          | \$ 1,585,575                         | \$ 1,024,695  | \$ 750,000   | \$ (86,995)                                    | \$ 647,875                     | \$ 617,725                             | \$ 617,725                 |
| 2          | 1,664,853                            | 1,075,930   | 1,100,000  | (235,095)                                      | 824,019                        | 714,246                                | 1,331,971                  |
| 3          | 1,748,096                            | 1,129,726   | 1,050,000  | (198,550)                                      | 816,920                        | 643,721                                | 1,975,692                  |
| 4          | 1,835,501                            | 1,186,213   | 1,050,000  | (184,327)                                      | 833,616                        | 597,161                                | 2,572,853                  |
| 5          | 1,927,276                            | 1,245,523   | 1,050,000  | (169,394)                                      | 851,146                        | 554,290                                | 3,127,143                  |
| 6          | 2,023,640                            | 1,307,799   |  | 329,286  | 386,554                        | 228,850                                | 3,355,992                  |
| 7          | 2,124,822                            | 1,373,189   |  | 345,751  | 405,881                        | 218,447                                | 3,574,440                  |
| 8          | 2,231,063                            | 1,441,849   |  | 363,038  | 426,175                        | 208,518                                | 3,782,958                  |
| 9          | 2,342,616                            | 1,513,941   |  | 381,190  | 447,484                        | 199,040                                | 3,981,997                  |
| 10         | 2,459,747                            | 1,589,638   |  | 400,250  | 469,858                        | 189,993                                | 4,171,990                  |
| 11         | 2,582,734                            | 1,669,120   |  | 420,262  | 493,351                        | 181,357                                | 4,353,346                  |
| 12         | 2,711,871                            | 1,752,576   |  | 441,275  | 518,019                        | 173,113                                | 4,526,459                  |
| 13         | 2,847,464                            | 1,840,205   |  | 463,339  | 543,920                        | 165,244                                | 4,691,704                  |
| 14         | 2,989,837                            | 1,932,215   |  | 486,506  | 571,116                        | 157,733                                | 4,849,437                  |
| 15         | 3,139,329                            | 2,028,826   |  | 510,831  | 599,672                        | 150,563                                | 5,000,000                  |
|            | <u>\$34,214,422</u>                  | <u>\$22,111,448</u>                                 | <u>\$5,000,000</u>                                       | <u>\$3,267,368</u>                             | <u>\$8,835,606</u>             | <u>\$5,000,000</u>                     |                            |

Starting revenue was determined by first developing the following formula which equates the initial investment (original asset base) to the discounted value of future cash flows:

(1)

$$a = \sum_{k=0.5}^{n-0.5} \frac{(r_k - e_k - t_k)}{(1+i)^k}$$

|                  |  |                  |  |
|------------------|--|------------------|--|
| a,               | asset base                               | r <sub>k</sub> = | r (1 + inf) <sup>k</sup>                               |
| i,               | cost of capital                          | e <sub>k</sub> = | e (1 + inf) <sup>k</sup>                               |
| tr,              | tax rate                                 | t <sub>k</sub> = | (r <sub>k</sub> - e <sub>k</sub> - d <sub>k</sub> ) tr |
| n,               | life of the stand-alone railroad         | r,               | starting revenue                                       |
| r <sub>k</sub> , | required revenue for period k            | e,               | initial cash operating expense                         |
| e <sub>k</sub> , | escalated operating expense for period k | inf,             | expected annual inflation                              |
| t <sub>k</sub> , | tax payment for period k                 | d <sub>k</sub> , | tax depreciation for period k                          |

The above equation was solved for "r," starting revenue, yielding the following formula:

<sup>28</sup>Weighted average cost-of-capital rate reflecting after-tax debt and equity rates.

<sup>29</sup>Excludes noncash expenses such as "book" depreciation. Return of capital is implicit in DCF analysis. All expenses are before financing.

<sup>30</sup>Variable means are defined on the following page.

(2)

$$r = \frac{a + e(1 - tr) \sum_{k=0.5}^{n-0.5} \left(\frac{1 + inf}{1 + i}\right)^k - a tr \sum_{k=0.5}^{n-0.5} \frac{g_k}{(1 + i)^k}}{(1 - tr) \sum_{k=0.5}^{n-0.5} \left(\frac{1 + inf}{1 + i}\right)^k}$$

$g_k$ , Tax depreciation rate for period  $k$

Thus, by substituting the value of the original asset base, the operating cost, the rate of inflation, the statutory tax rate, the accelerated tax depreciation factors, and the cost-of-capital rate into Equation 2, the starting revenue amount and subsequent inflated revenue amounts which produce a net present value of the cash flows equal to zero may be determined.<sup>31</sup>

The DCF approach has the advantages of directly recognizing the tax consequences arising from the hypothetical competitor's assets and of eliminating the need to separately index various components of SAC to avoid double counting capital-cost inflation.

## EFFECTS OF IMPLEMENTATION

The Ex Parte No. 347 (Sub-No. 1) guidelines neither prescribe precise costing methodology nor endorse or reject any general approach to determining SAC.<sup>32</sup> Where the guidelines address costing issues, they are consistent with the application of the RAPB's Principles to SAC.

While only two proceedings have been decided under the ICC's maximum rate guidelines, the RAPB's Principles are generally consistent with the intent of the ICC standards.<sup>33</sup>

<sup>31</sup>The example assumes that the investor has no other income against which to apply the tax losses and must carry forward tax losses. If this assumption is not the case, the starting revenue would be \$1,547,362 rather than \$1,578,252 as shown in the Example.

<sup>32</sup>See Ex Parte No. 347 (Sub-No. 1), *supra.*, at 542.

<sup>33</sup>ICC Docket No. 38783, *Omaha Public Power District v. Burlington Northern Railroad Company*, served Nov. 20, 1986, and ICC Docket No. 36719 (and embraced cases), *Arkansas Power & Light Company, et al. v. Burlington Northern Railroad Company, et al.*, served May 13, 1987.

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# CHAPTER 11

## Competitive Access

### EXPLANATION

Competitive access is the commencement or preservation of railroad service to a particular shipper or group of shippers by more than one railroad.<sup>34</sup> Its purpose is to increase, obtain, or maintain intra-modal railroad competition. In competitive access cases, the ICC may

- require a railroad to provide switching service for another railroad (reciprocal switching),
- grant rights to one railroad to operate over the tracks of another railroad (trackage rights), or
- deny joint rate/route cancellations.

The RAPB has addressed competitive access only to the extent that the ICC uses cost information in these cases. Furthermore, the RAPB has limited its examination of competitive access costing issues to the incremental costs of competitive access. In deciding these cases, the ICC may consider numerous factors in addition to incremental cost, such as

common and joint cost, revenue needs of the granting railroad, and the access needs of the requesting railroad and/or shippers.

In reciprocal switching and trackage rights cases, the ICC uses costs, in addition to other information, to establish compensation levels where access has been granted but carriers cannot agree on compensation.<sup>35</sup> In joint rate/route cancellation cases, the ICC uses costs to determine relative efficiencies of alternative routes.<sup>36</sup>

This chapter focuses on costs for reciprocal switching and trackage rights cases. These costs are the incremental costs associated with the additional use of specifically identified facilities and services. Because the cases normally involve a well-defined sub-segment of a railroad system, cost assignments from direct observations are frequently practical.

In contrast, the scope of joint rate/route cancellations may range from the cancellation of a tariff containing a single rate or route to the blanket cancellation of tariffs encompassing hundreds of

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<sup>34</sup>The term "shipper" as used here means either consignee or consignor.

<sup>35</sup>The ICC has authority under 49 USC 11344(c) to attach merger conditions which may include granting trackage rights. The ICC has authority to require terminal trackage rights under 49 USC 11103(a) and reciprocal switching agreements under 49 USC 11103(c). In the past, the ICC has encouraged parties to establish compensation, but the ICC may establish compensation if the railroads are unable to reach an agreement within a reasonable time period.

<sup>36</sup>See 49 USC 10705(a), (c), and (e) and 49 CFR 1144 (50 FR 46066, Nov. 6, 1985). In addition, the ICC may establish divisions of revenue among railroads in a joint rate dispute; however, this authority has not been used in recent years.

rates and routes and involving movements over virtually an entire railroad system. Joint rate/route cancellation cases typically use average variable movement costs. These costs are developed from GPCS subject to movement-specific adjustments. GPCS are discussed in Part III, and a separate discussion of their application to joint rate/route cancellation cases is not necessary here.

According to one party, avoiding double-counting inflation and excluding monopoly rents in capital costs are issues pertinent to joint rate/route cancellation cases and, therefore, should be explicitly addressed by the RAPB. Double-counting capital costs is, in fact, precluded by the Railroad Accounting Principles, and treatment of monopoly rents is an ICC rate-setting matter.

## **APPLICATION OF PRINCIPLES TO COMPETITIVE ACCESS CASES**

All of the Principles potentially apply to competitive access costs.

### **Causality**

The avoidability criterion of the Causality Principle implies that incremental costs are relevant in competitive access cases. Costs that would not have been incurred without the origin or destination switching of the line-haul railroad's traffic are avoidable costs of reciprocal switching. Similarly, costs that would not have been incurred without the movement of the tenant's trains over joint tracks are avoidable costs of trackage rights.

Incremental competitive access costs are necessary as a floor for compensation levels, but they may be insufficient as a ceiling for compensation levels.<sup>37</sup> This insufficiency is due to the presence of common fixed costs which are not causally separable among participants in a competitive access arrangement and the need to set rates above cost in specific situations.

Common fixed costs are costs the landlord or switching railroad may incur for activities, plant, or equipment from which the line-haul railroad (in the

case of reciprocal switching) or the tenant railroad (in the case of trackage rights) derives benefits but which would be incurred at the same level regardless of whether competitive access was granted. Such a fixed cost could be capital cost of right-of-way land, for example.

Competitive access compensation levels may be set by the ICC so that, in addition to each participant bearing its incremental costs, common fixed costs are shared among the beneficiaries. Such compensation levels would represent an effort by the ICC to provide for the recovery of common fixed costs which, although invariant, must be recovered if the provider of competitive access services or facilities is to survive. Establishing such compensation levels would require allocation of common fixed costs.

Allocation of common fixed costs among beneficiaries in the absence of causal relationships is not addressed by the Railroad Accounting Principles. Because they are fixed, these costs do not vary even if competitive access is granted. According to the Causality Principle, costs can only be attributed to competitive access if the costs would not have been incurred but for the requirements of the competitive access. Therefore, common fixed costs are not causally attributable.

The fact that allocation of common fixed costs is not addressed does not preclude the ICC, however, from selecting particular allocation approaches to establish compensation levels. Moreover, the computation of common fixed costs before allocations, if used, should be made in accordance with the Principles.

Cost assignments based on direct observation and engineering analysis are normally preferred to those based on average variable costs derived from GPCS. In addition, since competitive access applications typically pertain to services using specifically identified facilities rather than the entire railroad system, such cost assignments may be practically undertaken.

Where facilities are shared among railroads, engineering approaches may be useful in determining the avoidable portion of facility-related capital costs

<sup>37</sup>The RAPB's consideration in competitive access is limited to incremental costs. The RAPB does not address rate-setting. In establishing competitive access compensation levels, the ICC may use factors in addition to incremental cost. Even if compensation is established solely on the basis of cost information, incremental costs may be insufficient for this purpose.

which is causally attributable to joint access. For example, engineering formulas may be used to estimate the reduction of rail life due to the addition of a tenant's traffic to a line. The capital costs associated with the diminution of the landlord's track are part of the incremental costs of trackage rights.

GPCS may be used where direct observation or engineering analysis is not practical or where a particular cost component represents the use of an interchangeable resource which has the same cost throughout the system (Practicality and Homogeneity Principles).

Competitive access costs are affected by the time period orientation clause of the Causality Principle because competitive access can be granted for any length of time. Generally, as the length of the time period increases, less costs are fixed. As additional cost components vary with the incidence of long-run competitive access, they should be included in competitive access costs.

The time period sensitivity of competitive access costs is particularly pertinent to capital costs. For example, a continuing commitment of greater plant and/or equipment capacity than that required without the additional competitive access traffic is an incremental capital cost resulting from long-run access. This incremental capital cost may not be pertinent to short-run access.

### **Entity**

The relevant entity for determining incremental competitive access costs is limited to the facilities and activities provided by one railroad for access by another railroad.

### **Cost of Capital**

Capital cost components are governed by the Cost of Capital Principle and the Asset Valuation and Related Expense Principle.

The nominal cost-of-capital rate used may be either the industry-wide or an individual rate (of the switching railroad in the case of reciprocal switching or the landlord railroad in the case of trackage rights).

### **Asset Valuation and Related Expense**

Asset valuations should reflect current market values, preferably for the specific incremental assets

required or consumed as a result of access. Such asset valuations represent the opportunity cost of assets which must be recovered by the owner to encourage their continued provision. However, they should not include monopoly rents resulting from an owner's prior control of access. Current market values for particular assets required for access may be more or less than the values shown on the owner's books depending on the availability and remaining productive capacity for the assets. Consequently, site-specific and/or asset-specific current market valuations are preferable to trended book values based on railroad system-wide averages.

An appropriate DCF methodology is preferred for determining annual capital costs without double counting capital cost inflation. For example, see Chapter 10, page 63.

## **ANALYSIS SUPPORTING/ REJECTING CHANGES TO THE APPLICATION**

Although the RAPB has not adopted a general hierarchical preference for approaches to establishing causality, it believes that direct observation or engineering approaches are generally preferable to the use of GPCS for competitive access applications. The use of GPCS may result in the inclusion of costs for facilities not used in a particular access case, or it may misstate the actual costs associated with the particular facilities for which access is sought.

Regardless of the preference for direct observation or engineering approaches, GPCS may be used to compute competitive access costs. GPCS (or unit costs from such systems) may be used where the absence of detailed data or the cost of developing such data prevents direct observation or engineering analysis (Practicality Principle). GPCS may also be applied where resources used in access are interchangeable across the railroad system and, therefore, average costs are appropriate (Homogeneity Principle).

Several commenters stressed the importance of including specific costs of the actual facilities used in competitive access rather than relying on GPCS. The parties expressed concern that the use of GPCS may result in improper allocations of costs not attributable to competitive access. As a solution to this problem, one party suggested that the RAPB pursue the use of cost center accounting information for competitive access.

The RAPB considered the use of cost center accounting, but determined that the cost of maintaining such information system-wide would likely be greater than the benefit for this application. Although the RAPB prefers specific cost identification approaches for competitive access applications, the RAPB also recognizes that the costs of developing such information must be weighed against numerous considerations in each individual case. Some of these considerations are the miles of track involved, the number and complexity of facilities involved, the amount of time available for preparing cost evidence, and the potential benefits or losses that could result if competitive access is granted or denied. Consistent with the Practicality Principle, the level of cost detail in each case may differ depending on the specific circumstances in each case.

As described further in Part III, "General Purpose Costing Systems," the use of GPCS is intended as a means of establishing causal relationships between the performance of an activity and the incurrence of costs. When applied in accordance with the Causality and Homogeneity Principles, the use of GPCS may be a practical means of estimating incremental competitive access costs while minimizing improper attribution of costs.

### **Causality**

The RAPB believes that participants in competitive access arrangements should bear at least their incremental costs. This concept is consistent with the avoidability criterion of the Causality Principle and is not controversial.

Commenters proposed that the RAPB adopt one of two treatments of common fixed costs. The first treatment is to compute trackage rights costs to equal the landlord's total cost minus costs the landlord would no longer incur as a result of a tenant providing its own operating service (consistent with maximum rate guidelines), such as equipment capital costs, locomotive fuel costs, and train labor costs.

For application to competitive access cases, this treatment does not meet the avoidability criterion in the Causality Principle because it assigns all common fixed costs to the tenant and does not reflect the incremental costs incurred as the result of the provision of access. Moreover, an individual railroad's total cost (on a per traffic unit basis) is likely

to be greater than the current economic cost of a shared facility which benefits from economies of traffic density.

The second treatment is to compute competitive access costs so that they do not pose a greater cost burden on the tenant than on the landlord. This treatment implies full cost allocation, which does not fulfill the requirements of the Causality Principle for cost assignment. To accomplish this cost comparability, proponents recommend that common fixed costs, including non-incremental capital costs, be allocated between railroads on a relative usage basis. Such allocations do not represent an identification of causal relationships between costs and the performance of an activity or service. Rather, they are designed to achieve competitively balanced compensation levels.

Allocation of costs where a causal relationship does not exist may be unavoidable in competitive access cases, but such allocations represent regulatory ratemaking. Selection of a particular allocation method depends on the policy objective of the regulator. Policy objectives may include achieving fairness among joint users, sustaining a carrier's ability to earn adequate revenues, maintaining cost parity among competitors, or encouraging economic efficiency. Selection of allocation methodology is aided little, if at all, by a strictly economic cost perspective.

The RAPB has determined that such selections are best left to the ICC since they involve application of regulatory policy.

The RAPB has concluded that only incremental costs fulfill the causality requirements for determining economically accurate competitive access costs.

### **Entity**

Numerous parties commented on the RAPB's proposed treatment of entity for competitive access. Several commented that the relevant entity for competitive access should be restricted to the facilities and activities used in competitive access. They suggested that costs for facilities and activities not used in competitive access are irrelevant and their inclusion in an analysis could provide an opportunity to include a portion of economic rents realizable only because one railroad controls access.

Another commenter stated that the entity should

not be restricted to the facilities and activities directly used in competitive access because the ICC should have the ability to consider all economic effects of granting access or setting a specific compensation level. This commenter stated that, for example, a party seeking access should bear a portion of support facilities costs if necessary for the facilities for which access is sought, even if the support facilities are located elsewhere. However, this argument addresses the compensation to be paid, not costs.

In any case, the RAPB defines the entity consistent with the Causality Principle: the entity should capture the costs which are incremental to the provision of competitive access. It believes that consideration of additional factors in deciding to grant or deny competitive access requests or in establishing competitive access compensation levels is a matter of ICC policy.

### **Capital Costs**

The avoidability of certain cost components—particularly capacity-related capital costs—depends on the length of time for which access is granted. As the length of time for access increases, more costs become variable. Capital costs of capacity-related assets tend to be fixed in the short run, but are variable in the long run.

Capital cost computations require determination of a cost-of-capital rate, valuation of the assets used, and application of a capital recovery methodology.

The RAPB determined that a nominal cost-of-capital rate is appropriate for competitive access costs. The Cost of Capital Principle provides for the nominal cost-of-capital rate because it avoids the practical estimation problems associated with computing the real cost-of-capital rate.

Alternatives for competitive access asset valuation considered by the RAPB were historical and current market.

The RAPB believes that, where capital costs are relevant, current market values should be used for competitive access costs. Competitive market returns on current market values represent the opportunity costs of incremental assets and are the relevant economic costs for future movements involving access. Permitting an owner to earn a competitive market return on the current market value of the assets encourages that owner to continue providing

the incremental assets in competitive access service.

Current market values may be more or less than the values shown on the owner's books. For example, where the property may be lightly used or where it may be redundant as the result of a merger, current market values may be less than book values. In urban areas, the converse may be true.

Even though estimation of current market values is more burdensome than the use of historical asset values, determining the current value of the incremental assets typically should not be a problem. Unlike revenue adequacy applications, which require valuation of the entire railroad's asset base, the incremental assets used in a particular competitive access case typically represent a small portion of the railroad's total assets.

On the other hand, the specific identification and current valuation of assets may be impractical in particular cases, such as extensive trackage rights imposed in a merger case. In such cases, valuation techniques used in SAC estimation may be required. These techniques may include engineering estimates or railroad system-wide applications of trended net original cost.

In addressing the question of whether to use national or individual railroad cost-of-capital rates, the RAPB's preference for actual costs suggests that the cost-of-capital rate for the switching road (in the case of reciprocal switching cases) or the landlord road (in the case of trackage rights) should be used rather than a national cost-of-capital rate. However, as recognized previously, where an individual railroad's cost-of-capital rate is impractical to compute, the national rate may be used. The RAPB has decided either individual railroad or nationally determined cost-of-capital rates are acceptable.

In considering DCF and utility capital recovery methodologies, the RAPB concluded that application of a current nominal cost-of-capital rate to a current market value asset base encourages the use of a DCF capital recovery methodology. As discussed in the preceding chapter on maximum rate costs, the DCF methodology enables an initial cost to be set such that it can be indexed subsequently without recovering inflation twice. The utility methodology, on the other hand, requires separating capital costs from operating expenses to avoid indexing capital costs and, thereby, recovering inflation

twice. In addition, it results in front-loaded capital charges. Regardless of the capital recovery methodology used, double-counting of capital costs must be avoided.

## EFFECTS OF IMPLEMENTATION

The ICC has not established general rules for determining reciprocal switching charges or trackage rights compensation when parties cannot agree on an amount. Rather, ICC policy establishing compensation has been articulated on a case-by-case basis. Therefore, to apply the Railroad Accounting Principles in these two areas of competitive access, the ICC would have to establish new rules rather than change existing rules.

The ICC has not prescribed rules for computing reciprocal switching costs. Moreover, unlike trackage rights, the ICC has not prescribed reciprocal switching charges in any case in recent years.<sup>38</sup>

In past cases involving maximum reasonable switching charges, the ICC has relied at times on costs developed from a cost formula called Terminal Form F.<sup>39</sup> This formula is designed to develop costs for the various types of switching performed in a particular terminal.

Terminal Form F is a full cost allocation formula rather than a measure of incremental costs. Although it produces actual terminal-specific operating statistics and expenses, which comport with the RAPB's general preference of site-specific and movement-specific costs over railroad-wide average costs, it allocates many of the expenses across switching services on the basis of factors such as track feet and switching minutes. These allocations are not made on the basis of causal relationships and, therefore, are not addressed by the Railroad Accounting Principles. While the need for such allocations may meet the ICC's requirements for rate-setting, these allocations are not an issue with respect to economically accurate costs.

As in the case of reciprocal switching, no general ICC rules exist regarding trackage rights compen-

sation. However, the application of Railroad Accounting Principles may be compared with ICC practices in past trackage rights compensation cases, where the ICC has used such factors as:

- Variable costs incurred by the landlord as a result of tenants' operations.
- Tenants' share, on a car-mile percentage use basis, of maintenance and operation (M&O) expenses.
- Tenants' share, on a usage basis, of an interest rental component representing return on road property investment.

The first two factors encompass incremental costs in accordance with the Railroad Accounting Principles; the third factor focuses on issues other than determining economically accurate costs. The first factor clearly conforms with the application of the Causality Principle: variable costs incurred by the landlord as a result of a tenant's operations represent incremental costs of trackage rights.

The second factor conforms with the Causality Principle if the assumption is made that the tenant's share of M&O expenses, based on percentage of usage, approximates the incremental M&O costs. This assumption, if used, should be supported on a case-by-case basis.

The third factor represents a blend of incremental costs and rate-setting. For example, a portion of road property investment may represent retention of capacity which could be liquidated if the tenant's traffic did not move. This portion of capital costs is incremental and should be assigned entirely to the tenant.

However, a portion of total road property investment is likely to be fixed, such as the returns on right-of-way land and grading. Usage-based allocation of the total current market value of road property, including fixed cost items, reflects the ICC's desire to place the tenant in precisely the position of the owning road. Allocation of fixed cost items between parties must be made on the basis of whatever policy objectives are sought by the ICC, not on the basis of causality.

<sup>38</sup>Although reciprocal switching has been prescribed by the ICC in recent years, compensation was not prescribed. For example, see Finance Docket No. 29802, *Delaware and Hudson Railway Co. v. Consolidated Rail Corporation - Reciprocal Switching Agreement*, 367 ICC 718 (1983).

<sup>39</sup>ICC Terminal Form F, 9-64, *Formula for Use in Determining Rail Terminal Freight Service Costs*. (Sept. 1964).

The ICC's rejection of replacement valuation and historical valuation approaches in favor of current market valuation conforms with the Asset Valuation and Related Expense Principle. However, the RAPB has not recommended adoption of the ICC's capitalized earnings approach or any other current market valuation methodology.

In addition, two other components of the "interest rental" methodology accepted by the ICC differ from the RAPB's Cost of Capital Principle. The incorporation of an effective tax rate differs from the RAPB's approach which directly recognizes the cash flow effects of deferred taxes in the DCF methodology.

Also, use of the historic book ROI from the landlord's R-1 as the rate of return (cost-of-capital rate) differs from the RAPB's approach which adopts a current market cost-of-capital rate.

While the discussion to this point has focused on line-haul trackage rights, another (and seldom used) form of trackage rights is terminal trackage rights. Terminal trackage rights, as the name implies, may

be prescribed as an alternative to reciprocal switching where competitive access is desired.

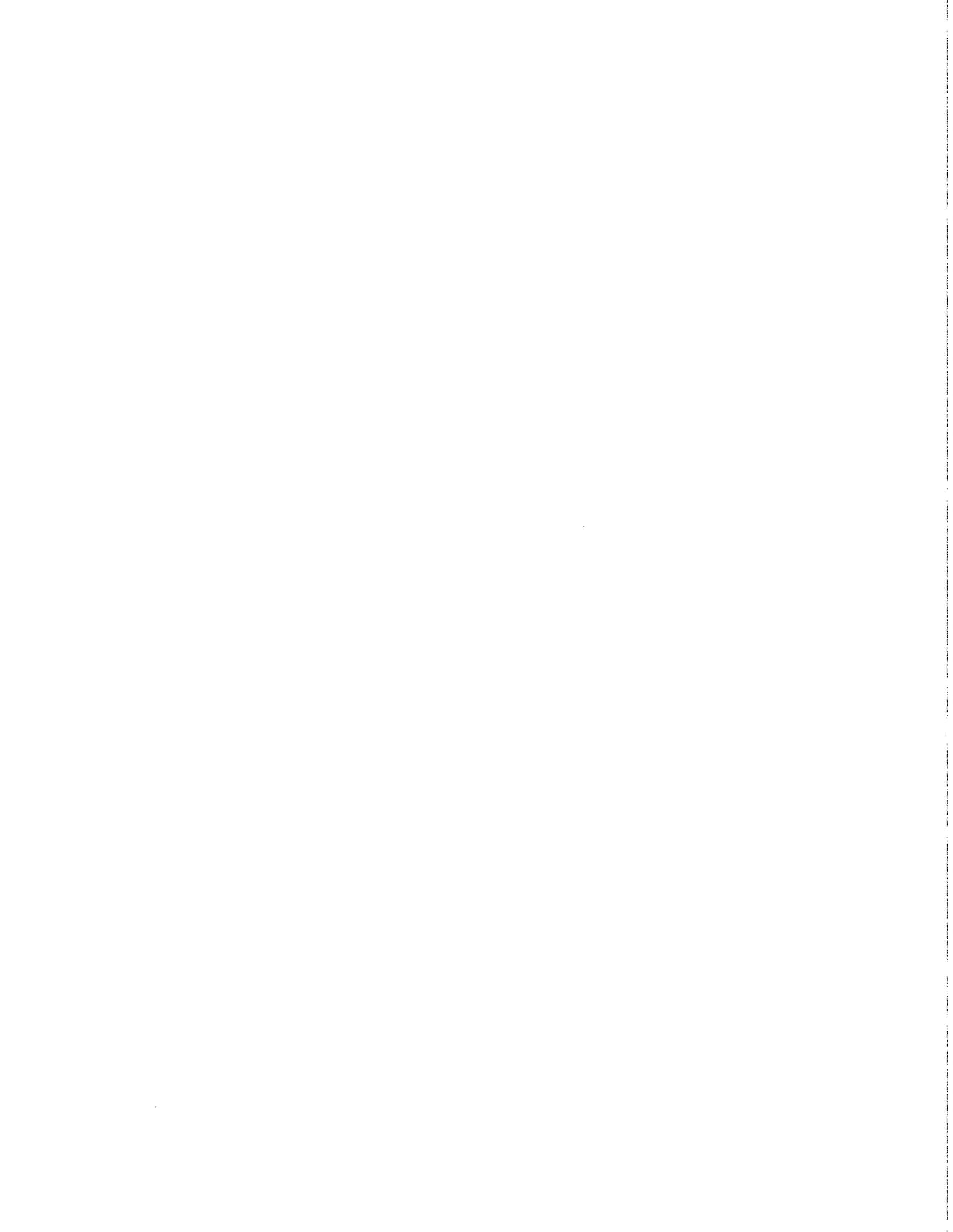
According to the statute governing terminal trackage rights, the ICC must establish compensation "under the principle controlling compensation in condemnation proceedings."<sup>40</sup> In the past, the ICC has interpreted this statutory language to mean that terminal trackage rights costs, other than M&O costs, must be assigned on a "numerical" basis, i.e., on the basis of equal shares among users regardless of the level of usage.<sup>41</sup>

However, costs calculated using the "equal shares" methodology are not incremental costs and, therefore, conflict with the Causality Principle. In the RAPB's view, economically accurate non-maintenance and nonoperating costs for terminal trackage rights should be assigned in the same manner as line-haul trackage rights. Incremental portions of those costs are assignable on the basis of causality for determining both terminal and line-haul trackage rights costs. Fixed portions of such costs are not assignable on the basis of causality; their assignment is an ICC rate-setting matter.

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<sup>40</sup>49 USC 11103(a).

<sup>41</sup>ICC Docket No. 15682, *Missouri-Kansas-Texas Railroad Company v. Kansas City Terminal Railway Company*, 198 I.C.C. 4 at 11, 12, and 31 (1933).



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# CHAPTER 12

## Abandonment/Surcharge

### EXPLANATION

Two related applications of railroad costs are branch-line abandonments and light-density line surcharges.<sup>42</sup> Both applications typically pertain to light-density lines which carriers believe are unprofitable.

In the following analysis, costs for abandonment applications and costs for surcharge applications are not distinguished. Cases involving the two applications do not appear to have material differences in economically accurate costs.<sup>43</sup> Both applications do, however, require an assessment of the revenues and expected costs (both operating expenses and opportunity costs) of continuing to own and operate a line.

### APPLICATION OF PRINCIPLES TO ABANDONMENT AND SURCHARGE CASES

All of the Railroad Accounting Principles apply to abandonment and surcharge costs.

#### Causality

The concept of avoidability contained in the Causality Principle is central to determining relevant economic costs for abandonment and surcharge decisions.

In evaluating branch-line profitability, those costs which would be avoided if branch-line service were discontinued plus the opportunity cost of assets used in this service are computed. The expected revenues generated by branch-line service and changes in branch-line asset values for a specified time period must exceed the costs for the same time period if the line is to be profitable.<sup>44</sup>

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<sup>42</sup>The SRA also authorized joint line rate surcharges, but the railroads' authority to initiate such surcharges has expired under 49 U.S.C. 10705a(p)(1). Consequently, only light-density line surcharges are addressed by the RAPB.

<sup>43</sup>The RAPB recognizes, as noted by one commenting party, that the ICC uses RFA variable costs for off-branch avoidable costs in abandonment cases while it is required to use 110 percent of RFA (or its successor) variable costs for light density line surcharge cases. However, the underlying variable costs in both types of leases are computed using the same methodology.

<sup>44</sup>Several commenting parties expressed concern that the RAPB was failing to differentiate between "avoidable costs" and "opportunity costs" as applied by the ICC in abandonment cases. The RAPB has restricted its discussion of abandonment and surcharge costs to economic costs pertinent to assessing profitability of specific lines. The weight which the ICC places on the various components of economic costs of operating versus abandoning a line are implementation and policy matters for the ICC. Consequently, the RAPB does not address these issues.

The relationship between the approach used to establish causality and the relevant time orientation of costs is important in determining avoidable branch-line costs under the Causality Principle. Strictly from an economic viewpoint, abandonment and surcharge decisions are based on estimates of future profitability of the branch line.<sup>45</sup>

While avoidable costs of traffic moving on a branch line may be observed directly, avoidable costs of traffic moving off a branch line (off-branch costs) may be interchangeable or difficult to observe. In such cases, causality may be established through cost variability analysis in GPCS. Thus, average variable costs developed from GPCS may be more appropriate than directly observed costs.

### **Homogeneity**

Costs of traffic moving off the branch line may be interchangeable with costs of other traffic moving over the same lines. According to the Homogeneity Principle, average variable costs from GPCS are more appropriate than directly observed costs in such cases. For example, where numerous trains move over main line segments, the actual trains which handle a particular branch-line's traffic when it leaves the branch may be determined largely by chance.

### **Practicality**

Since the cost of direct observation would likely outweigh any benefits of more accurate off-branch costs, the Practicality Principle also suggests that GPCS should be used to determine off-branch costs. For example, traffic originating or terminating on a branch line may move for hundreds, or even thousands, of miles off the branch over the applicant railroad's system. Avoidable line-specific capital costs and avoidable movement-specific operating costs for off-branch traffic would be extremely burdensome to identify.

The specific circumstances in each case must be considered by the ICC using the requirements of the Causality and Practicality Principles as a guide. Cases in which significant costs may not be avoided until sometime in the future should use multiple-year estimates of cash flow. However, as in the example above, many cases may use single-year estimates because of cost/benefit considerations.

<sup>45</sup>The RAPB recognizes that the ICC may consider numerous factors in addition to line profitability in determining whether "public convenience and necessity" will be served by permitting abandonment.

### **Data Integrity**

Under the Data Integrity Principle, cost estimates in abandonment and surcharge cases should be supported by underlying source records or an explanation of the rationale and key assumptions used. Because of the importance of line-specific cost information in these cases, such estimates should be free from error and conform to ICC accounting standards. ICC discovery and rebuttal procedures may be used to ensure data integrity.

### **Entity**

The entity is the branch line for which the abandonment or surcharge is sought and that part of the railroad entity affected by the branch line.

Since revenues from branch-line traffic cannot rationally be separated between on-branch and off-branch, the avoidable costs of branch-line traffic moving off-branch must also be included in the analysis.

### **Cost of Capital**

Relevant capital costs in abandonment and surcharge cases reflect opportunity costs. Opportunity costs are the returns that could have been earned by liquidating the branch line and reinvesting the proceeds or redeveloping its assets in the best alternative use available.

Opportunity costs are computed by applying a cost-of-capital rate to the value of the branch-line's assets. Opportunity cost components are determined by the Cost of Capital Principle and the Asset Valuation and Related Expense Principle.

The cost-of-capital rate, according to the Cost of Capital Principle, may be either a national or railroad-specific rate comprised of the weighted average of the nominal current cost of debt and equity capital. It should include the cost of equity component on a pretax basis to reflect the statutory combined federal and state income tax rate, since revenues associated with the assets to be liquidated would be taxed at the marginal rate. The cost-of-capital rate reflects an average rate which could be earned by railroads if they retired debt and equity with the proceeds from disposition of the branch-line assets.

## **Asset Valuation and Related Expense**

Branch-line assets should be valued at current market value less the estimated cost of removal and disposal. This valuation measure is typically called NLV and should include working capital and income tax benefits or liabilities forgone. Such valuations comport with the opportunity cost concept appropriate for abandonment and surcharge costs and reflected in the Asset Valuation and Related Expense Principle.

Ideally, off-branch assets should be valued in the same manner as on-branch assets. However, as mentioned previously, estimates of off-branch costs frequently use GPCS for practicality reasons, and GPCS typically reflect asset valuations at acquisition cost less accumulated depreciation.<sup>46</sup>

Expected changes in asset values should be included as capital gains or losses in determining the profitability from continuing branch-line operations. Recognition of capital gains or losses is necessary to avoid double counting for inflation since a nominal cost-of-capital rate, which reflects expected inflation, is used in conjunction with a current value asset base.

The RAPB believes that the asset base for abandonment and surcharge cases should include working capital and asset-related tax consequences of continuing to operate the line. Working capital committed to continued branch-line operation and tax gains or losses which would have resulted from disposal of branch-line assets represents funds which could be employed in alternative uses.

## **Productivity**

In accordance with the Productivity Principle, when input price indices are applied to historical abandonment or surcharge costs, such indices should incorporate appropriate changes in productivity. The productivity measure may be either a national average or an individual productivity measurement depending on whether a national or individual index is used. The appropriate measure should be decided by the ICC on the basis of the integrity of the information furnished by the parties in the proceeding. Use of productivity-adjusted indices should reduce

the chance that branch-line profitability would be understated due to cost projections that fail to reflect current productivity of resources.

## **ANALYSIS SUPPORTING/ REJECTING CHANGES TO THE APPLICATIONS**

One commenting party stated that costs that are not avoidable on a long-term basis should be excluded from consideration in abandonment cases. The party suggested that where costs will continue to be incurred long after the branch line is abandoned (i.e., more than five years after), those costs should not be included in avoidable costs.

The relevant time orientation and costs for a regulatory decision must be established in accordance with the Causality and Practicality Principles. For branch-line abandonment decisions, long-run costs are relevant because of the irreversible nature of line abandonments. Thus, all costs which would be avoided in the future ideally would be considered. However, as the year in which costs are avoided moves farther into the future, the present value of the costs avoided (savings) becomes increasingly less significant. Thus, in a particular abandonment case, the appropriate number of years for evaluating cost avoidability must be established by the ICC on the basis of the existence of a causal relationship and the materiality of the cost's present value.

The RAPB focused primarily on the application of the Cost of Capital and Asset Valuation and Related Expense Principles to abandonment and surcharge cases as they represent the major items at issue.

The RAPB adopted the concept of valuing branch-line assets at their opportunity cost. In abandonment or surcharge cases, NLV represents an asset's opportunity cost which is consistent with the Asset Valuation and Related Expense Principle.

One party expressed concern that equipment valuations based on opportunity costs not be equated with replacement costs established on the basis of the purchase price of new equipment. The party stated that the Causality Principle requires that

<sup>46</sup>Ch. 7, "Asset Valuation and Related Expense," discusses problems encountered in estimating current market values for an entire railroad's asset base as used in GPCS.

opportunity costs depend on future demand for the specific equipment used in branch-line services.

The RAPB concurs with the statement that opportunity costs do not necessarily equal replacement costs. The concept of opportunity cost valuation was previously addressed in Chapter 11, "Competitive Access" (see p. 75), where, for long-run applications, opportunity cost valuation was equated to current market value. Current market valuation depends on the remaining productive capacity for the assets being valued and the demand for their services in the best alternative use. This concept is consistent with the avoidability criterion of the Causality Principle.

However, the RAPB does not require the valuation of each specific piece of equipment used on a line subject to abandonment. According to the Homogeneity Principle, if particular assets represent interchangeable resources, the average market value for the homogeneous pool of assets should be used. For example, if the normal power requirement for a train serving a branch line is one 2,000-horsepower locomotive unit, the average current market value of a railroad's 2,000-horsepower locomotive unit fleet would be preferable to the current market value for a particular 2,000-horsepower locomotive unit used on the branch during the past month. The fact that the particular locomotive unit was used on the branch line during the past month is likely to be largely a matter of chance rather than the reflection of a causal relationship between the service provided and the cost incurred.

Analysis of the appropriate cost-of-capital rate for abandonment and surcharge cases focused primarily on whether a real or nominal rate should be used. Proponents for the use of a real rate claim that a real rate must be used in conjunction with an NLV asset base since the NLV asset base is at a current cost level and already includes inflationary effects. They claim that the use of a nominal rate will result in the double recovery of inflation in capital costs.

Other proponents for the use of a real cost-of-capital rate state that application of the Practicality Principle requires the use of a real rate. They maintain that, while the use of a nominal cost-of-capital rate would require complex indexing of diverse capital

assets, the use of a real cost-of-capital rate, computed by using a general measure of inflation, is appropriate for use in abandonment cases.

Proponents for the use of a nominal rate claim that opportunity costs are the cost of foregoing abandonments, not the expected earnings of the line. Thus, they say that the cost foregone should reflect the nominal rate which could be earned on the value of the assets. These proponents believe that the use of a real rate is appropriate only for assets which will not be abandoned and will be revalued annually.

From a prospective viewpoint, the RAPB recognized the potential for double counting inflation if a nominal cost-of-capital rate were applied to an appreciating asset base in abandonment and surcharge capital costs. However, it rejected the real cost-of-capital rate due to practical measurement problems.<sup>47</sup> Instead, the RAPB resolved the double count of inflation by directly including projected capital gains or losses in the abandonment or surcharge analysis. Projections of changes in asset values would be made at the branch-line level and should be more accurate than general economy-wide inflation estimates typically used in computing real cost-of-capital rates.

The present NLV times the nominal cost-of-capital rate equals the opportunity cost of capital for retaining the branch line. However, if the rate of inflation of the assets on the line equals the rate of inflation implicitly reflected in the current nominal cost-of-capital rate, a nominal rate and recognition of capital gains or losses will produce the same results as a real rate with no recognition of capital gains or losses.

For example, from a strictly economic viewpoint, if NLV times the nominal cost-of-capital rate is less than the expected net operating income plus capital gains for a year, then the line should be retained. Alternatively, assuming the investors' expected inflation rate approximates the rate of inflation of branch-line assets, the real cost-of-capital rate could be used in the analysis. In this case, if the real cost-of-capital rate times the NLV is less than the expected net operating income for a year, the line should be retained. A numerical example of the equivalency of the returns under both approaches is shown below.

<sup>47</sup>See Ch. 6 for a further discussion of problems in estimating a real cost-of-capital rate.

**EXAMPLE OF EQUIVALENCY OF NOMINAL  
COST-OF-CAPITAL RATE TIMES NLV AND REAL  
COST-OF-CAPITAL RATE TIMES FUTURE NLV  
INCLUDING CAPITAL GAINS**

| Using Nominal Cost-of-Capital Rate                |         |                                       |
|---|---------|---------------------------------------|
| 1. NLV 1/1/87                                     | \$1,000 | (Assumed)                             |
| 2. Pretax Nominal Cost-of-Capital Rate            | 25.5%   | (Ex Parte No. 458)                    |
| 3. Return on NLV                                  | \$ 255  | (Line 1 × Line 2)                     |
| Using Real Cost-of-Capital Rate                   |         |                                       |
| 1. NLV 1/1/87                                     | \$1,000 | (Assumed)                             |
| 2. Capital Gain                                   | \$ 38   | (Assuming 3.8% Annual Inflation Rate) |
| 3. NLV 1/1/88                                     | \$1,038 | (Line 1 + Line 2)                     |
| 4. Pretax Real Cost-of-Capital Rate <sup>48</sup> | 20.9%   | [(1.255/1.038) - 1]                   |
| 5. Return on NLV                                  | \$ 217  | (Line 3 × Line 4)                     |
| 6. Return plus Capital Gain                       | \$ 255  | (Line 2 + Line 5)                     |

The RAPB remains unconvinced that changes in branch-line asset values using general measures of economy-wide inflation can be estimated accurately. The opportunity costs of the assets on the line should be computed using the unique circumstances surrounding each line abandonment case. For example, inflation in land prices, often a significant portion of NLV, is likely to be influenced largely by location rather than by general economy-wide inflation.

The RAPB also remains unconvinced that estimating future asset values for specific branch-line assets is necessarily impractical. The same experts who develop the NLV estimates in abandonment cases may be able to attach reasonable estimates of expected inflation for these specific assets. In addition, the ICC maintains index price series which it applies to specific asset groups in estimating trended net original cost. These index series may provide an appropriate basis for estimating future inflation. If estimating inflation for specific branch-line assets proves to be impractical, the ICC has the authority to make suitable adjustments consistent with the Railroad Accounting Principles.

Finally, several parties expressed concern that the present abandonment application rules—which

require submission of revenue and cost data for the most recent 12-month period and the preceding two calendar years—would be discontinued by the ICC because of the RAPB's emphasis on the prospective nature of branch-line costs. The RAPB has not addressed this issue. Consistent with the Data Integrity Principle, if prospective costs submitted in abandonment cases are based on actual historical costs incurred on a branch line, the cost estimate should be supported by underlying source records and an explanation of the rationale and key assumptions used. Establishing or modifying rules for the presentation of cost evidence in abandonment cases (or any other type of ICC proceeding) is an implementation issue appropriately left to the ICC.

## EFFECTS OF IMPLEMENTATION

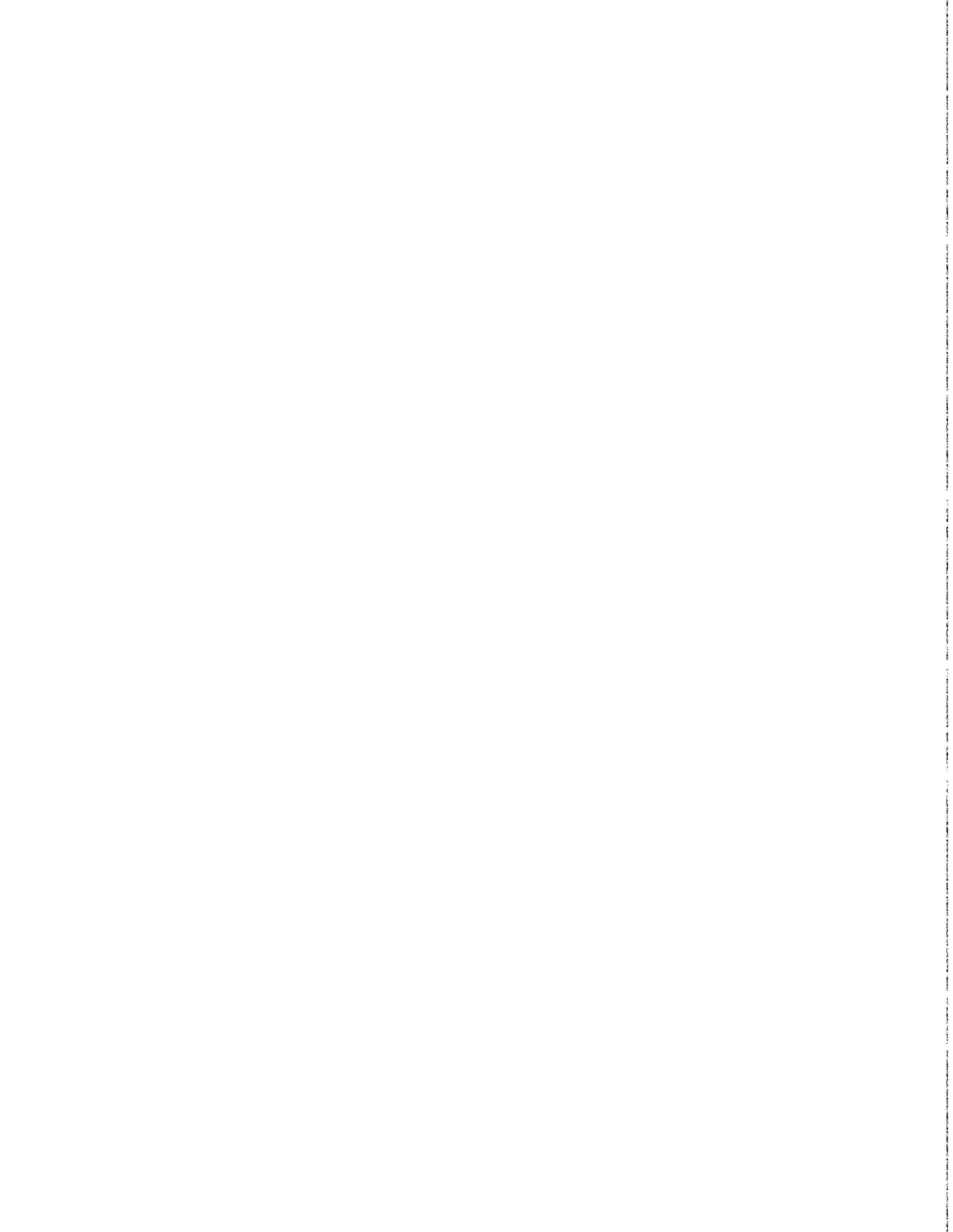
The Railroad Accounting Principles are generally consistent with current ICC procedures for presentation of cost evidence in abandonment and surcharge cases.

However, three differences in abandonment and surcharge costing result from application of the Railroad Accounting Principles:

- The ICC does not include capital gains or losses in the analysis. The RAPB would include capital gains or losses for a one-year period. If significant avoidable costs are expected to be uneven from year to year, the RAPB would recommend multiple period analysis.
- The ICC uses a real cost-of-capital rate.<sup>49</sup> The RAPB has rejected the use of a real cost-of-capital rate in favor of a nominal cost-of-capital rate.
- The ICC requires avoidable cost information for the two calendar years preceding the application and for the latest 12-month period for which data can be reasonably developed. The RAPB believes that abandonment and surcharge cases are forward-looking analyses and must, therefore, include estimates of future costs.

<sup>48</sup>To simplify the computation, the method for computing the real cost of capital in this example differs slightly from the ICC's present recommended approach. See Ex Parte No. 274 (Sub-No.3c), *Abandonment of Railroad Lines—Use of Opportunity Cost*, 11.C.C. 2d 203 (1984).

<sup>49</sup>Ex Parte No. 274 (Sub-No. 11), *Abandonment Regulations—Costing*, served Jan. 23, 1987.



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# CHAPTER 13

## Minimum Rate/Long-Cannon

### EXPLANATION

The ICA prohibits railroads from setting rates below a reasonable minimum level. Costs play an essential role in evaluating minimum rate reasonableness.

The ICA also contains three factors, known as the Long-Cannon factors, which must be considered by the ICC in determining whether a rate exceeds a reasonable maximum level.<sup>50</sup>

1. The amount of traffic which is transported at revenues which do not contribute to going concern value and efforts made to minimize such traffic.
2. The amount of traffic which contributes only marginally to fixed costs and the extent to which, if any, rates on such traffic can be changed to maximize the revenues from such traffic.
3. The carrier's mix of rail traffic to determine whether one commodity is paying an unreasonable share of the carrier's overall revenues.<sup>51</sup>

The RAPB considered only the first Long-Cannon factor, which uses the same type of costs as those used for minimum rate proceedings. It did not con-

sider the second and third Long-Cannon factors because they pertain to management pricing efficiency and cross-subsidy considerations where the role of cost is not clearly defined. Subsequent references to Long-Cannon costs, therefore, only pertain to the first Long-Cannon factor.

Since the ICC is responsible for rate-setting decisions, the RAPB has not attempted to establish minimum rates. The RAPB has examined minimum rate/Long-Cannon costs only to determine the minimum costs which must be recovered to contribute to the entity's going concern value.

### APPLICATION OF PRINCIPLES TO MINIMUM RATE/LONG-CANNON COSTS

The Causality, Homogeneity, Practicality, Cost of Capital, and Asset Valuation and Related Expense Principles apply to the determination of minimum rate/Long-Cannon costs.

#### Causality

Two aspects of the Causality Principle are pertinent to these applications: avoidability and time

<sup>50</sup>These factors are called the "Long-Cannon" factors because they were contained in an amendment to the SRA offered by Senators Long and Cannon.

<sup>51</sup>49 U.S.C. 10707a(e)(2)(C).

orientation. Avoidability, as applied to minimum rate/Long-Cannon cases, means that the costs would not have been incurred but for the movement of the traffic under consideration. Avoidable costs must be recovered if the traffic is to contribute to the railroad's going concern value.

Time orientation of costs, as applied to minimum rate/Long-Cannon analysis, means that the time period for which the rate under consideration will apply must coincide with the period to which the costs apply. Generally, as the length of the time period of the movement increases, capacity-related capital costs become more flexible. Consequently, a movement for a short-run time period designed to take advantage of excess capacity may incur little, if any, additional capital costs. On the other hand, a movement over a long-run time period may require additional capital costs or retention of capacity which could otherwise be liquidated.

### **Homogeneity**

The Homogeneity Principle requires the use of average costs when the resources used are interchangeable. In the case of minimum rate applications, for example, an RFA or URCS average variable cost per gross ton-mile (including items such as locomotive fuel cost, locomotive maintenance cost, and track maintenance cost) may be used to compute line-haul costs of lading. The amount of each of these resources consumed per ton-mile is the same regardless of whether the ton-miles are generated by the particular traffic under consideration or by some other traffic.

### **Practicality**

The use of components from GPCS is also permitted by the Practicality Principle. For example, because conducting site-specific studies to estimate applicable costs may be prohibitively costly when compared to the revenue to be realized from a short-term movement, the average variable cost for the applicable type of activity may be obtained from GPCS.

### **Cost of Capital**

To the extent capital costs are relevant to minimum rate/Long-Cannon costs, the cost-of-capital rate to

be applied will be determined by the Cost of Capital Principle. Either an individual railroad rate or a national rate may be used. The rate should be comprised of the market-weighted average of current nominal debt and equity costs.

### **Asset Valuation and Related Expense**

Similarly, where capital costs are relevant to these applications, the Asset Valuation and Related Expense Principle provides the basis for determining the value of the asset base. Consistent with the opportunity cost focus of this Principle, assets should be valued at their best alternative use. Such values may range from zero cost to current market value depending on the particular circumstances of each case as shown in these three examples:

- Where short-run idle capacity is used, no alternative use of the assets exists, and the assets' value for minimum rate purposes is zero.
- Where equipment is used which would be liquidated but for the movement of the traffic under consideration, net salvage value would be the appropriate valuation.
- Where traffic under consideration is using assets for which an alternative transportation demand exists, current market value would represent the opportunity cost of such assets.

### **ANALYSIS SUPPORTING/ REJECTING CHANGES TO THE APPLICATION**

The ICC has established two measures for use in evaluating minimum rate reasonableness: the presumptive cost floor (PCF) and directly variable cost (DVC).<sup>62</sup>

The PCF is defined as the sum of the line-haul cost of lading, applicable switching costs, and station clerical costs. A rate that does not equal or exceed the PCF shall be presumed to be unreasonable.

DVC is the sum of the PCF and any other costs proven by a complaining party to vary directly with a particular movement to which a challenged rate applies. A rate that equals or exceeds DVC is con-

<sup>62</sup>Ex Parte No. 355, *Cost Standards for Railroad Rates* (364 I.C.C. 898 (1981)).

clusively presumed to contribute to the entity's going concern value.

A party wishing to challenge the minimum reasonableness of a rate, therefore, must prove that the rate is either less than the PCF, or greater than the PCF but less than the DVC of the movement under consideration.

The RAPB considered alternative general costing approaches for minimum rate/Long-Cannon costs, including:

- PCF costs plus any additional costs which vary directly with the traffic at issue. The time period for which costs are determined would be handled on a case-by-case basis.
- DVC based on variable costs, excluding depreciation, from GPCS. Specific cost data applicable to a particular movement could be substituted for GPCS costs.
- Long-run incremental costs defined as all prospective operating and capital costs of providing a service.

The first alternative has an advantage of sensitivity to the time period for which the rates are expected to apply. Because capacity-related capital costs become more flexible as the length of the time period for analysis increases, the first alternative permits the flexibility needed to incorporate relevant costs in minimum rate/Long-Cannon analysis.

The second alternative has the practical advantage of prescribing a relatively precise costing formula. However, not all variable costs from GPCS would directly result from moving the traffic under consideration or, conversely, would be avoided by not moving such traffic. For example, GPCS variable costs may include capital cost components which represent excess capacity within the time period for which the traffic would move. Such costs would be irrelevant to minimum rate/Long-Cannon costs.

The third alternative incorporates long-run incremental costs which, by definition, precludes analysis from a short-run perspective. As a result, such costs may include capacity-related capital costs which are not pertinent in the short run. Use of

these costs in evaluating movements expected to occur only in the short run is unsupported and would appear to be counter to the legislative intent to permit pricing flexibility.<sup>58</sup>

The RAPB believes the first alternative is the economically accurate approach to determining minimum rate/Long-Cannon costs. One commenting party expressed concern that permitting opportunity cost to include net salvage value for minimum rate/Long-Cannon applications could result in higher rates to captive shippers by increasing the degree of differential pricing sought by the railroads. The party urged the RAPB to embrace, at a minimum, DVC as the measure for use in evaluating minimum rate reasonableness.

The RAPB continues to believe that, consistent with the Causality Principle, the flexibility inherent in the recommended approach is necessary so that only avoidable costs for the traffic under consideration in each case are incorporated in the analysis. The opportunity cost of using railroad assets in a particular service is an avoidable cost which depends on, among other things, the time period for which the service will be provided.

Examples of cost items, in addition to the PCF cost items (specific lading, switching, and clerical costs) which may be included in minimum rate costs are terminal handling costs, specialized services costs, capital costs, and empty car movement costs. This list is not intended to be exhaustive, and these items would be included only if they are relevant to the particular movement at issue.

With the exception of the three specific (PCF) cost items previously mentioned, the pertinent components for minimum rate costing vary according to the circumstances surrounding each movement. Consequently, the RAPB has not attempted to identify specific cost items or cost formulas to be included or excluded in minimum rate/Long-Cannon costing nor has it attempted to suggest any particular time period or asset valuation methodology for such costs.

## EFFECTS OF IMPLEMENTATION

Application of the Railroad Accounting Principles to minimum rate cases or to the development of

<sup>58</sup>See H.R. Rep. No. 1430, 96th Cong. 2nd Sess. 89-90 (1980).

Long-Cannon evidence does not require changes in present ICC rules or procedures to the extent that such rules or procedures exist.

Criteria used by the ICC to evaluate minimum rate cases have been discussed previously. The case-by-case flexibility provided by the PCF and DVC mea-

asures are compatible with the application of the Railroad Accounting Principles to these cases.

The ICC has not established rules for developing cost information for use in evaluating the Long-Cannon factors.

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# CHAPTER 14

## Rail Cost Adjustment Factor

### EXPLANATION

The SRA provides for using an RCAF to pass inflationary cost increases to customers through rate increases. It requires the ICC to either compile the index of railroad costs on its own or to verify an index developed by others and to adjust it not less than quarterly. Railroads may implement RCAF rate increases without ICC approval, and the resulting rate is subject to only limited review or challenge.

Specifically, 49 U.S.C. 10707a(a)(2)(B) states:

“Commencing with the fourth quarter of 1980, the Commission shall, as often as practicable but in no event less often than quarterly, publish a rail cost adjustment factor which shall be a fraction, the numerator of which is the latest published Index of Railroad Costs (which index shall be compiled or verified by the Commission, with appropriate adjustment to reflect the changing composition of railroad costs, including the quality and mix of material and labor), and the denominator of which is the same index for the fourth quarter of 1980, or for the fourth quarter of 1982 or for the fourth quarter of every fifth year thereafter, as appropriate.”

In its present form, the RCAF is calculated by using an index of industry-wide railroad prices. The ICC has considered computation of the RCAF in Ex

Parte No. 290 (Sub-No. 2), *Railroad Cost Recovery Procedures*. In this proceeding, the ICC instructed the Association of American Railroads (AAR) to compute the index required by the SRA, subject to ICC review and approval. As of January 2, 1985, the individual price index components (upon which the RCAF is based) consist of the following categories:

- Labor.
- Fuel.
- Materials and supplies.
- Equipment rents (car hire and lease payments).
- Depreciation.
- Other expenses.

Generally, the RCAF is developed from forecasts of the prices of components comprising the AAR index for the subsequent quarter. Prices for some of the components of the index are forecast. Prices for other components represent actual prices projected forward to account for differences between purchase date and expected use. Price index components are multiplied by their respective weights and summed to obtain a composite index. The component weights are adjusted annually to reflect changes in the composition of total costs in the previous year.

The ICC compares the forecasted index with actual index values after the fact to identify major problems in the forecast index and the underlying methodology. Then it assesses the validity of the forecast index values on the basis of previous forecasting accuracy. In addition to its own procedures, the ICC also requires the AAR to engage an independent public accountant to audit the procedures involved in calculating the index.

The ICC's decision to adopt an RCAF developed from the AAR price index was challenged because productivity was not included. In *Western Coal Traffic League v. United States*, 677 F.2d 915 (D.C. Cir.), cert. denied, 459 U.S. 1086 (1982), the court rejected arguments that the SRA statutorily requires or precludes productivity adjustments to the index used to translate inflationary cost increases into rate increases. The court also rejected arguments that inadequate revenues provide an independent reason for not adjusting the index, and that productivity adjustments would undermine incentives for growth. Nevertheless, the court affirmed the ICC order establishing the RCAF, ruling that the ICC acted reasonably in concluding that the methodological problems in measuring productivity made a productivity adjustment inappropriate at the time. However, in affirming the ICC order, the court expressed its expectation that the ICC would proceed with its stated intention to reconsider the omission of productivity from the RCAF.

In Ex Parte No. 290 (Sub-No. 4), served September 27, 1984, the ICC requested further comments on the applicability of a productivity adjustment to the RCAF. In particular, it sought comments on the Caves/Christensen methodology. As of the date of this report, the ICC has not issued a decision.

## **APPLICATION OF PRINCIPLE TO THE RCAF**

The Productivity Principle requires that cost indices measure both change in price and change in productivity. This requirement is best accomplished through adjustments to the indices to incorporate changes in productivity as well as input prices.

A productivity adjustment to the RCAF is neither statutorily required nor precluded. Adjusting the RCAF for productivity is an issue which must be resolved by the ICC in rulemaking. However, the RAPB believes that a productivity adjustment is

necessary for the RCAF to measure cost changes accurately.

The Productivity Principle does not recommend a specific productivity measure or model. The selection of a specific model and procedures for applying that model are implementation issues best reserved for the ICC. The RAPB believes that by relying on existing work and presently available expertise, an appropriate productivity measure should be implemented within 18 months of publication of the Railroad Accounting Principles.

## **ANALYSIS SUPPORTING/ REJECTING CHANGES TO THE APPLICATION**

Comments were received addressing issues such as concern about double-recovery (pass-through of productivity gains), revenue adequacy/pricing freedoms, incentive to innovate, and practicality. The comments raised points addressed extensively before the ICC in Ex Parte No. 290 (Sub-No. 4).

The RAPB considered and rejected recommending that, irrespective of what the RCAF is to measure, no productivity adjustment be made to the RCAF. It rejected this alternative on the basis of an analysis of six issues:

- Economic Accuracy.
- Contestability.
- Double Recovery of Productivity Gains.
- Revenue Adequacy/Pricing Freedoms.
- Incentive to Innovate.
- Practicality.

### **Economic Accuracy**

Although economic accuracy is discussed in Chapter 8, it is a key issue in the application of the Productivity Principle to the RCAF.

Changes in input prices, productivity, and output (either as a single measure of volume or as a composition of measures) are the major sources of change in total costs experienced. By definition, at a given level of output, inflation increases costs and productivity growth reduces them. Applying an input price index without a productivity adjustment may

cause cost changes to appear greater than they actually are. The simple illustration below demonstrates this point.

#### EFFECTS OF PRODUCTIVITY CHANGE ON COST

|                          | Quarter 1 |         |         |
|--------------------------|-----------|---------|---------|
|                          | Fuel      | Labor   | Total   |
| Quantity                 | 2         | 2       |         |
| Unit Price               | \$10.00   | \$10.00 |         |
| Price × Quantity         | 20.00     | 20.00   | \$40.00 |
|                          | Quarter 2 |         |         |
| Quantity                 | 1.5       | 2       |         |
| Unit Price               | \$15.00   | \$10.00 |         |
| New Price × Old Quantity | 30.00     | 20.00   | \$50.00 |
| New Price × New Quantity | 22.50     | 20.00   | 42.50   |

In this example, an input price index would be 1.2500 (\$50.00/\$40.00), while a cost index would be 1.0625 (\$42.50/\$40.00).

The RCAF as currently formulated only would produce an accurate measurement of the change in output unit costs from one period to the next when there is no productivity change, i.e., when productivity change is implicitly valued at zero in the calculation.

#### Contestability

A significant argument for including a productivity adjustment is the limitation on contestability for any adjusted base rate as defined in 49 U.S.C. 10707a(a)(2)(A):

“‘adjusted base rate’ means the base rate for the transportation of a particular commodity multiplied by the latest rail cost adjustment factor published by the Commission pursuant to this paragraph.”

Under 49 U.S.C. 10707a(b)(2), rate increases resulting from the application of the RCAF to base rates may not be found to exceed a reasonable maximum. Therefore, potential over-estimation of railroad cost increases is a crucial issue.

#### Double Recovery of Productivity Gains

Some parties have stated that incorporation of a productivity adjustment might result in a double pass-through of productivity gains if, for competi-

tive reasons, a railroad has already held down a rate increase. However, this argument focuses only on the one implementation methodology that may produce the effect described.

According to statute, the base rate, not the individual existing rate currently charged, is adjusted by the RCAF. Thus, if a railroad has held back any portion of a rate increase in the past, the current rate will not be affected as long as it is at or below the adjusted RCAF times the base rate. Other procedures for implementing RCAF increases may preclude any problem from occurring.

#### Revenue Adequacy/Pricing Freedoms

Views on the role of productivity in revenue adequacy determinations are diverse. Some parties have stated that a small over-estimation in productivity measurement could have serious consequences since the railroad industry is generally revenue inadequate. However, others have argued that revenue adequacy is a separate issue from productivity.

A productivity adjustment to the RCAF should not preclude the railroads from achieving their revenue adequacy goals. The RCAF does not constitute a rate ceiling, except in the case of captive traffic already bearing rates at or above the ICC-determined maximum reasonable level. Other procedures are generally available to railroads seeking additional rate increases: the zone of rate flexibility (if revenue inadequate) and individual rate increases above that level. However, obtaining individual rate adjustments through procedures other than the RCAF requires additional time and effort on the part of the railroads.

#### Incentive to Innovate

Diverse views are held on the effect a productivity adjustment would have on incentives to innovate. Some parties have stated that a productivity adjustment would reduce the railroad industry's incentive to increase productivity. Others have maintained that rate regulation should result in rates which approximate those which would be set under competitive conditions.

It has been stated that innovators in competitive markets do not transfer to their customers the full amount of productivity gains immediately. In the short run, firms retain a share of the gains in the form of increased profit margins (or reduced losses).

Except for this increased return, the firms would have no incentive to incur the risks and costs of innovations. In the long run, other firms attempt to gain the same benefits for themselves, eventually forcing market prices to levels commensurate with current productivity and cost levels. This process, however, may take many years. Thus, an innovating firm in a competitive market may retain a significant share of the benefits accruing from its productivity gains.

Others have observed that even with a productivity adjustment based on industry-wide experience, each railroad would remain motivated to improve its own performance since resulting cost savings flow directly into net income. Railroads should continue to see profit increases from industry-wide productivity improvements, until those improvements have been experienced long enough to be fully represented in a higher level on the productivity trend line. Railroads may benefit from productivity gains even where their rate increases are reduced by the full amount of the savings in cost, since profits may increase to the extent that a higher volume of traffic results from lower freight rates.

Some economists consider competition and regulatory lag as two motivators for innovation. Competition helps to increase the efficiencies, productivity, and innovation that strengthens industries. Recognizing productivity on a lagged basis allows

innovators to keep gains from productivity improvements for a certain amount of time.

### **Practicality**

Some commenters expressed a related concern that inaccuracies in any productivity measurement technique may permit more than 100 percent of productivity gains to be passed through to shippers. In such a case, railroads would be penalized for any productivity gains. The RAPB believes that, in implementing any particular methodology, the ICC can include procedures to minimize the potential for overstatement due to inaccuracies of the measurement technique. Several approaches have been suggested to the RAPB for minimizing overstatement, such as use of a simple division of measured productivity changes, a lagged measure, or more sophisticated statistical techniques. The RAPB takes no position on the merits of any of these approaches.

The RAPB has reviewed information regarding several productivity models. It has concluded that a practical productivity methodology can be implemented in a timely manner which, when used in combination with input price indices, will yield economically accurate measurements of cost changes. The RAPB recommends that an appropriate productivity adjustment to the RCAF be implemented by the ICC within 18 months.

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# PART III

## General-Purpose Costing Systems

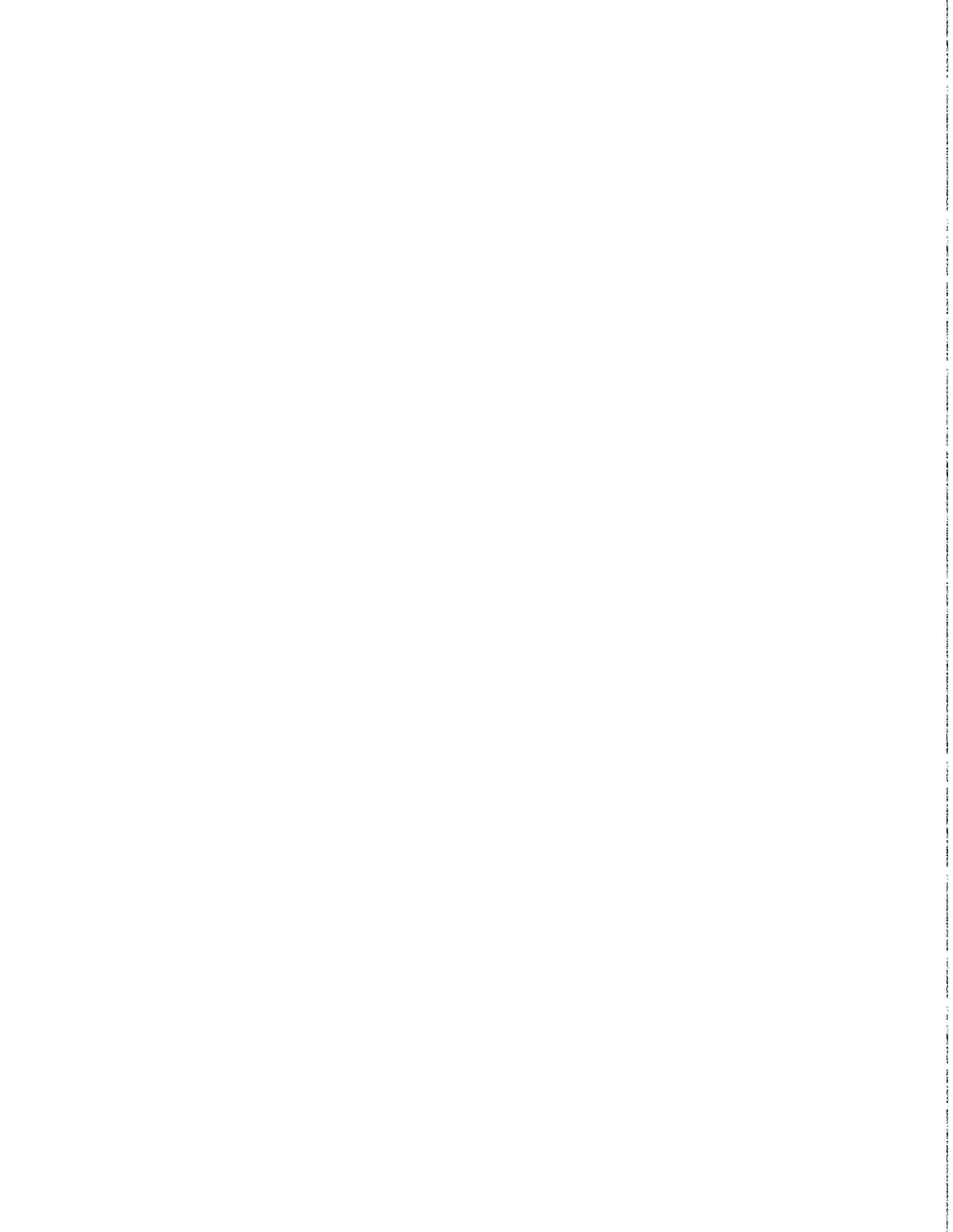
GPCS have long been used by the ICC to estimate the variable costs for performing railroad service. In the past, variable costs have been used in numerous regulatory proceedings, such as defining whether the ICC has jurisdiction to set a maximum rate or to determine off-branch costs in an abandonment proceeding.

The considerable amount of material on issues affecting GPCS has been organized into the following four chapters:

- Chapter 15 - Effects of the Railroad Accounting Principles
- Chapter 16 - Rail Form A and the Uniform Rail Costing System
- Chapter 17 - Regression Analysis Issues
- Chapter 18 - Information Requirements

Chapter 15 describes how the Railroad Accounting Principles will affect GPCS used by the ICC. It also provides background information on the nature of such costing systems and purposes for which they are used.

Chapters 16, 17, and 18 provide the rationale which supports the conclusions presented in Chapter 15. In some instances, the RAPB was unable to resolve an issue on the basis of available information. In those instances, the RAPB recommends that the information it has compiled be used by the ICC as the starting point for additional research efforts.



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# CHAPTER 15

## Effects of the Railroad Accounting Principles

GPCS are used to estimate the variable cost<sup>54</sup> of performing railroad services for numerous regulatory applications. The regulatory applications that may use GPCS costs consist of

- initiating ICC jurisdiction for setting maximum rates,
- computing the Cost Recovery Percentage,
- estimating off-branch costs for abandonment and surcharge proceedings,
- computing the directly variable costs used in minimum rate/Long-Cannon proceedings, and
- estimating certain cost elements in maximum rate or competitive access proceedings.

The total variable cost estimates represent an intermediate-term time orientation. Such costs typically include portions of capacity-related capital costs and overhead costs as variable costs. Because GPCS variable costs contain both long-term and short-term cost elements, GPCS costs are often substituted for either long-term or short-term costs when it is not practical to compute more accurate costs directly.

The RAPB has limited its analysis of GPCS to RFA and the URCS because:

- Both systems were developed by the ICC specifically for regulatory cost applications.
- The URCS is already developed and tested. Consequently, revision of regression equations (if found to be necessary as the result of further regression testing) could be made within the framework of the existing URCS, thus enabling a replacement GPCS for RFA to be implemented relatively quickly.
- Even though the RAPB solicited comments on alternatives to RFA and the URCS as GPCS, no alternatives were identified.

The RAPB is aware of comments by some econometricians (in response to ICC-initiated requests for comment) who suggest that alternatives to the URCS should be pursued. These econometricians suggest that the URCS contains fundamental problems in its basic formulation which cannot be redressed by simply modifying regression equations. For example, some contend that the URCS does not use state-of-the-art econometric technology and that it fails to incorporate essential aspects of sound economic

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<sup>54</sup>Several different methods for computing variable cost have been proposed. Further discussion regarding the method of determination is provided in Ch. 17, "Regression Analysis."

cost models. Some econometricians have proposed pure econometric models ranging from the very simple to the very complex. Others have proposed hybrid models which incorporate econometric and engineering aspects.

Without addressing the validity of the concerns expressed above, the RAPB believes that RFA or the URCS has several potential advantages over the alternative models proposed:

- Simple econometric models may not be suited for accurate estimation of individual movement costs.
- Complex econometric models are likely to require reporting of additional information. Additional reporting requirements may be difficult to justify in the face of limited application of GPCS.
- While such models may be theoretically preferable, a complex system that is not easily applied or understood by the community which uses rail costs may be of questionable value.

For GPCS, cost estimates are normally obtained by applying regression analysis to expense and output measures. The resulting equations identify the proportion of expense in each account group that changes in response to changes in output. The expense information is grouped on the basis of expectations of how specific expenses relate to output. In total, the expense information used equates to operating expenses reported according to GAAP.<sup>56</sup> The output measures, as well as annual expenses, are either reported to the ICC in the R-1 or computed from special study information.

The regression analysis is performed using pooled data consisting of both time series (in some equations, five single years) and cross-sectional (consisting of all Class I railroads) data.

The selection of an equation and the economic validity of the regression results is determined through (1) a logical explanation of the causal relationship, (2) results that are significant, as measured by accepted statistical tests, and (3) the judgment and experience of the researcher.

Two methods for applying the results of the statistical equations have been proposed. The first uses results of the regression analysis to segregate the

variable portion from total cost. Historically, the segregation has been performed in existing GPCS through either the cost elasticity or percent variable methods of variability determination. The second uses cost coefficients derived directly from the regression equation as unit variable costs. A more detailed discussion of this issue is presented in Chapter 17.

Once the variable costs for each account group have been segregated from total costs, they are divided by the appropriate output measures to obtain variable unit costs. These variable unit costs are multiplied by the appropriate measures of output (called "service units") and summed for each specific movement of goods to determine the variable cost of providing service.

## **EFFECTS OF THE RAILROAD ACCOUNTING PRINCIPLES**

Six Principles—Causality, Data Integrity, Entity, Cost of Capital, Asset Valuation and Related Expense, and Productivity—have a clear and direct impact on GPCS.

The other Principles—Homogeneity and Practicality—have a somewhat less clear and possibly contradictory impact on GPCS. These Principles impose conflicting requirements on the regression equations selected and the information requirements for GPCS.

### **Causality**

The Causality Principle indicates that either the cost elasticity or cost coefficient method should be used to measure how costs change with respect to output. For practicality reasons, the cost coefficient method has been rejected because it is incompatible with RFA and the URCS.

### **Data Integrity**

The Data Integrity Principle indicates that (1) regularly reported expense and output information used in GPCS should be audited periodically to ensure the information's integrity, (2) information used for establishing the equations used in GPCS should be audited periodically, and (3) the special study infor-

<sup>56</sup>However, in addition to Schedule 410, Operating Expense, a pretax cost of capital is computed and included in variable cost using default variability measures established and used by the ICC.

mation should be reviewed and updated periodically to ensure its validity and accuracy.

### **Entity**

The Entity Principle indicates that the railroad entity for all specific regulatory applications should consist of the consolidated or combined activities of affiliated railroads and their railroad-related affiliates. However, for practicality reasons associated with the cost of implementation and to provide additional data points for regression analysis, the RAPB recommends that, for now, the ICC permit the railroads to continue their present reporting entities for GPCS.

Should future consolidation of railroad reporting entities result in the material loss of data points and discrete information, reconsideration of geographic cost center accounting for transportation and maintenance-of-way expenses may be required. Cost center accounting information may be required in any case to meet the requirement of the Homogeneity Principle for the collection of sufficiently disaggregated data to support economically accurate costing.

### **Cost of Capital**

The Cost of Capital Principle indicates that the current nominal cost-of-capital rate is the most economically accurate measurement.

The RAPB recognizes that the ICA requires the use of the embedded debt rate for determining the Cost Recovery Percentage. Since adoption of the more economically accurate measure determined by the RAPB is preferred, the ICC should pursue whatever administrative or legislative remedies are necessary to permit its use.

### **Asset Valuation and Related Expense**

The net investment base used in GPCS for the cost-of-capital component should consist of the net assets less accumulated deferred tax credits, plus an allowance for working capital. To determine the net assets, the RAPB has determined that DA is more economically accurate than RRB accounting.

GPCS may use GAAP asset costs for reasons of practicality. However, more meaningful measures of value may be preferred and used for certain specific regulatory purposes.

### **Productivity**

Cost indices used to adjust costs should include an appropriate productivity adjustment. This issue is discussed in greater detail in Chapter 18, "Information Requirements."

### **Indirect Effects of Principles**

Application of the Homogeneity and Practicality Principles indirectly affects the determination of the appropriate GPCS model, regression analysis techniques, and information requirements. The RAPB makes several recommendations based on application of the Principles.

The ICC has developed the URCS to replace the RFA model in current use. While the RAPB believes that the URCS is a positive step toward the development of economically accurate GPCS, it has identified specific areas of the URCS requiring further study. The RAPB summarizes these areas involving URCS regression analysis below and discusses them in greater detail in the remaining chapters.

The RAPB believes that costs for GPCS derived from individual railroad data are the most economically accurate. However, it has concluded that individual cost elasticities derived from nationally pooled data are acceptable. The RAPB provides a discussion of the rationale supporting this determination in Chapter 17, "Regression Analysis Issues."

The RAPB recommends that further study should be undertaken by the ICC and completed before implementation of the URCS in the following areas:

- Testing alternative regression equation forms (linear and nonlinear) and alternative independent variables.
- Testing both size and density as separate independent variables and size/density hybrid variables (e.g., gross tons) for significance.

The RAPB believes that these studies should be completed within 18 months of the submission of this report.

The RAPB determined that, for GPCS, the ICC should permit Class I railroads to continue their present R-1 reporting requirements in conformance with the Practicality Principle regarding the costs of implementing changes. However, the RAPB does not intend to preclude substitution of more accurate information for specific regulatory uses of GPCS.

The Railroad Accounting Principles and recommendations will materially and directly affect the RFA and URCS methodologies and inputs used to compute variable costs.<sup>66</sup> The most significant use of GPCS variable costs is to determine ICC jurisdiction in maximum rate reasonableness proceedings by comparing the revenue-variable cost ratio to a statutorily mandated standard (the CRP), commonly referred to as the jurisdictional threshold.<sup>67</sup>

Most parties commented that a transition mechanism should be developed to avoid changing the amount of traffic subject to regulation through implementation of the RAPB's Principles in the GPCS. Comments varied on the role the RAPB should play in developing such transition mechanisms and the criteria used by the Congress to establish the SRA revenue-variable cost percentages.

One estimate indicates that the changes would have caused a 13-percent increase in variable railroad industry expenses and cost of capital: from \$23.3 billion using existing methodology to \$26.4 billion. While other estimates may indicate greater or lesser effects, in any case, the effects on variable cost are likely to be significant.

Therefore, the RAPB recommends that the ICC implement a transition mechanism upon implementation of the Railroad Accounting Principles. The RAPB has not addressed which approach is pref-

erable: several approaches are described below to illustrate that practical procedures appear to be readily available:

- Compute the revenue-variable cost percentage resulting from the new GPCS methodology that maintains the same relative difference between the revenue-variable cost percentage at revenue adequacy and the revenue-variable cost percentage applications described in the SRA.
- Compute the ratio of the industry average revenue-variable cost percentage resulting from the old and new GPCS methodologies. Multiply the ratio by the SRA revenue-variable cost percentages to obtain adjusted thresholds.
- Compute the percentages of traffic presently falling below the SRA revenue-variable cost percentages. Determine the revenue-variable cost percentage, based on the revised GPCS, which results in the same percentages of traffic falling below the SRA revenue-variable cost percentages.

Other approaches are possible, and the RAPB does not suggest that one of these approaches must be adopted.

A further discussion of reporting issues is presented in Chapter 18, "Information Requirements."

<sup>66</sup>Required modifications to the present RFA methodology are

1. replace the use of a cost-of-capital rate equal to the embedded debt cost with a current nominal cost-of-capital rate which includes a current debt cost,
2. remove deferred tax credits from the investment base, and
3. use DA for track structures rather than RRB accounting.

<sup>67</sup>The revenue-variable cost percentages defining the jurisdictional threshold are prescribed at 49 U.S.C. 10709(d). Other revenue-variable cost percentages are used at 10701a(b)(2), 10707a(e)(2)(A), and 10705a(b)(3)(A).

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# CHAPTER 16

## Rail Form A and the Uniform Rail Costing System

This chapter provides background information on RFA and the URCS, both of which develop variable unit costs using a USOA and special study information. It also provides the analysis supporting the RAPB preference for the URCS.

### RAIL FORM A

RFA<sup>58</sup> consists of equations supported by reported data and special studies. Over the period 1938-1973, RFA underwent many modifications to improve the accuracy and reliability of cost determinations. It has been used to estimate costs for both regional groups and individual railroads.

Numerous special studies, such as station clerical, switching minutes, and equated switching miles have been used in the absence of reported data. Most special studies are derived from regional or national information and then applied to individual carriers. Some studies are more than 40 years old.

The basic data used for RFA costing were reported annually (through 1977) by Class I railroads in the ICC-required Annual Report Form R-1. Cost, revenue, capital, and operating data were included in this report.

The cost variability of selected expense groups is determined from their corresponding quadratic

regression equations. A single variability percentage for each account group is calculated for the railroad industry and used to determine the variable portion of total expense in the following manner.

Reported operating expense for each account group is multiplied by its corresponding variability percentage to determine the variable portion of total account group expense. The variable expenses are then assigned or allocated to 1 or more of 57 cost categories. Variable expense allocations are made using either apportionment ratios developed by special studies or other formula approaches. Details of these formulas, including a listing of the 57 cost categories, are described in RFA, Statement 1F1-73, last published by the ICC in 1973.

The variable expenses are allocated or assigned to cost pools on the basis of their causal relationship with output measures and then divided by the output units to develop a variable unit cost for each cost category. The variable unit costs are used to compute movement-specific costs manually or through use of computer software programs.

### UNIFORM RAIL COSTING SYSTEM

The ICC, before 1976, had begun studying the issue of railroad accounting and costing. As part of the mandate of the 4-R Act, the ICC revised the USOA

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<sup>58</sup>First developed in 1938 by Ford K. Edwards of the ICC to determine rail costs in connection with the Uniform Class Rate Scale case.

to provide more accurate cost and revenue data. Upon passage of the Act, the ICC also began to develop a new costing system consistent with emerging USOA modifications. That system is the URCS.

Using a three-phase approach, the URCS transforms reported railroad expense and activity data into estimates of the variable cost of providing specific services. The three phases involve

- assembly of required data from the railroads and the statistical identification of variability and causal relationships between expenses and outputs (Phase I),
- development of variable unit costs for service components (Phase II), and
- generation of movement-specific costs from these unit costs (Phase III).

### **URCS Phase I**

The URCS requires the collection of a large amount of data for developing costs. This data base is developed from eight major sources of reported data as well as additional specialized engineering studies. The reported data include:

- ICC Annual Report of individual Class I railroads (R-1).
- Individual ICC Train and Yard Service Report (R-1 Schedule 755).
- ICC Quarterly Report of Freight Commodity Statistics (individually reported to the ICC).
- ICC Waybill sample of individual waybills sampled from all U.S. freight movements.
- AAR Weekly Equipment Loading and Unloading Reports (CS-54-1A and CS-54-1D).
- AAR Railroad Cost Recovery Indices (Series RCR) on both a regional and national basis.
- AAR Loss and Damage Report.
- AAR Universal Machine Language Equipment Register.
- Switching and Terminal Company Special Questionnaire.

The data are processed into a computer file, audited for accuracy, and stored in the URCS master information file data base.

Once the data base has been constructed, the statistical technique of regression analysis is applied to separate portions of the rail expense data. The analysis identifies operationally feasible and statistically significant relationships between rail expense groups and rail outputs. These relationships form the basis for computing variability.

### **URCS Phase II**

Phase II, similar to the RFA approach, is a mechanical process which

- computes the variability of each account group,
- separates individual expense accounts into fixed and variable portions, and
- assigns the variable portion to various measures of output and calculates unit costs.

### **URCS Phase III**

The movement costing program constructs costs for specific movements by applying variable unit costs to specific movement parameters.

## **COMPARISON OF RFA AND THE URCS**

Both RFA and the URCS use the same basic approach: application of a railroad's average unit costs to individual movement parameters. Both break down the total cost of a railroad into additive subcomponent account groups on the basis of functional rail operations (for example, road haul and switching). Both relate each subcomponent account group to one or more output measures using either regression analysis of one or more variables or default allocation. The output measure chosen may vary for each subcomponent account group.

RFA uses cross-sectional data averaged over several years for its regression analysis, while the URCS uses pooled data (cross-sectional and time series) for its regression analysis. Use of cross-sectional data reduces aggregate biases and has been shown to be a useful indicator for costing specific move-

ments (Griliches, 1972). Cross-sectional analysis (as proposed by the ICC), on the other hand, may mask railroad-specific relationships between cost and output.

The regression analysis techniques and their application to costing represent the major differences between RFA and the URCS. RFA uses nonlinear functions with respect to output, whereas the URCS uses linear functions.

Some argue that the linear functional form does not reflect production economies (or diseconomies). Rather, the linear functional form of the expense regressions is equivalent to specifying a fixed coefficient production technology (McBride, 1982, p. 379).

The ICC acknowledged this problem and justified the use of linear forms on the basis of superior statistical fit and the belief that linear approximations of nonlinear forms are adequate for estimating costs.<sup>50</sup> The ICC stated that the accuracy of reported information and the level of accuracy required by the user do not appear to justify the pursuit of a more complex theoretical approach.

Both RFA and the URCS rely heavily on the use of a single output measure, which may bias the estimated percent variable to the extent that expenses are a function of multiple outputs. Alternatively, inclusion of unnecessary multiple-output measures may cause individual coefficients to be unreliable even when the equation, taken as a whole, provides a reliable estimate of total cost for the account group.

RFA's underlying tenets are generally viable and consistent with the Railroad Accounting Principles. However, RFA is based on an accounting system discontinued eight years ago.

Both RFA and the URCS rely on the R-1 as a primary source of input data for cost formulas, supplemented by data provided by the AAR. However,

each uses a USOA containing differences in the underlying expense detail.

Railroad data maintained in the currently mandated USOA must be converted to conform to the former USOA to be used in RFA. The railroad industry has maintained that the process of converting the existing system of accounts back to the inferior system of accounting which it replaced is not rational. The industry also maintains that such a conversion is an expensive, time-consuming exercise which necessitates arbitrary account groupings and allocations and reduces both the utility and accuracy of the data.

Moreover, "natural" account groupings (salaries and wages, materials and supplies, purchased services, and general) in the new USOA, which are a unique feature of the URCS, may be lost in the conversion to the old USOA required by RFA. The loss of these account groupings makes it impossible to perform the more accurate indexing to a common year for regression analysis in the URCS.

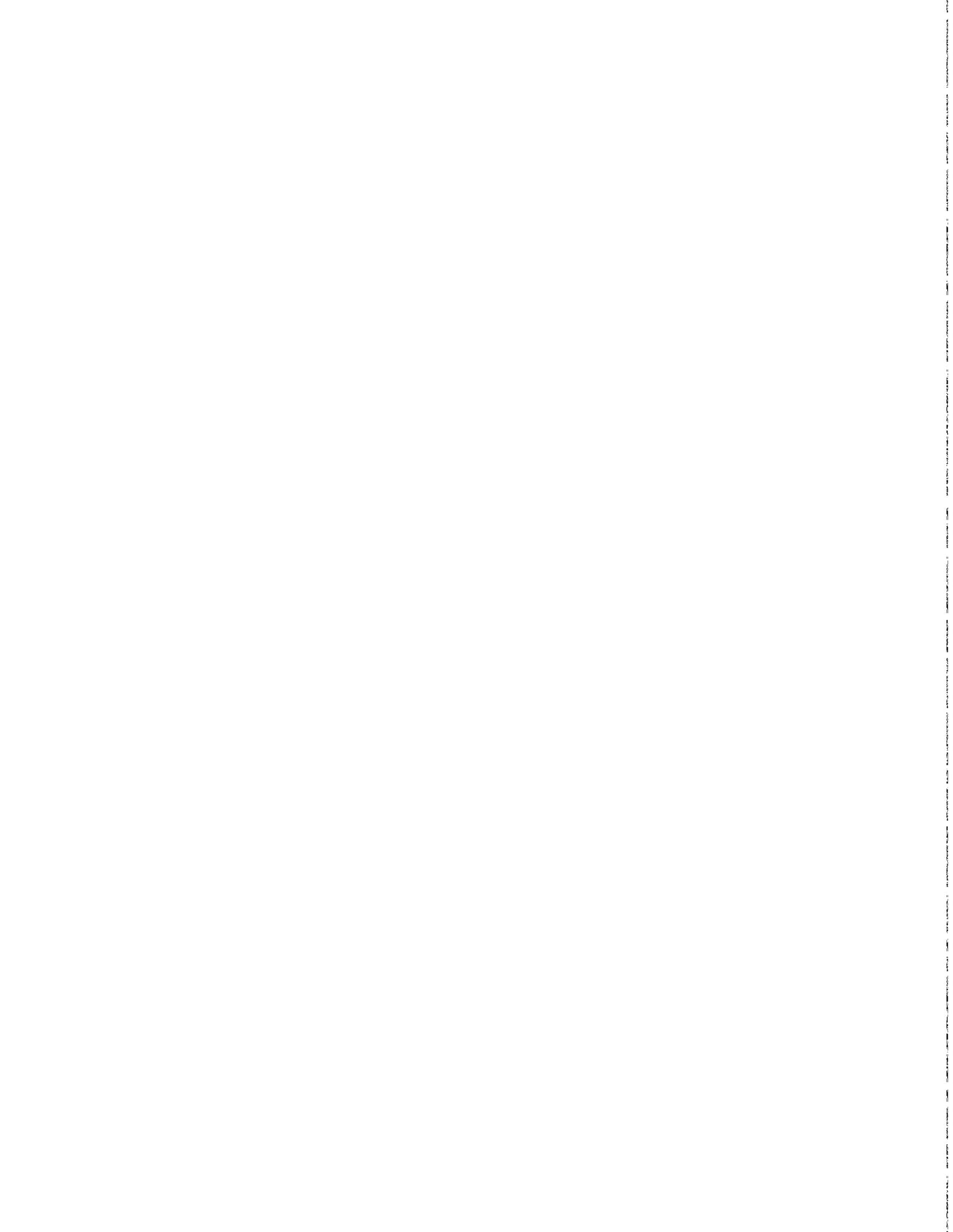
Some shippers, however, maintain that they have not encountered the problems alluded to by the railroad industry. For example, they have not found the conversion of USOA data in the preparation of RFA to be a problem. With regard to the RFA variability ratios, shippers note that it is within the ICC's power to keep them current.

Use of RFA also does not permit the realization of other significant improvements available through the current USOA, such as more detail in the functional account definitions, which in turn allows a more appropriate regression analysis.

Regression equations are more easily updated using the URCS than using RFA. For example, the URCS preprocesses data for use in regression analysis. RFA processing presently relies on static regression equations to estimate unit and movement costs; RFA uses variability ratios from the ICC's last regression study completed in 1972.

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<sup>50</sup>ICC Preliminary 1979 Rail Cost Study (1981), p. 39.



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# CHAPTER 17

## Regression Analysis Issues

Regression analysis is a statistical methodology used by RFA and the URCS to identify a causal relationship between cost and output. This analysis mathematically manipulates equations in which the value of one specific “explained” (dependent) variable is evaluated as a function of the values of one or more explanatory (independent) output variables.

The selection of an equation and the economic validity of the regression results is determined through (1) a logical explanation of the causal relationship, (2) results that are significant, as measured by accepted statistical tests, and (3) the judgment and experience of the researcher.

Regression analysis is performed in three steps. First, available data (normally total expense in a cost category for each railroad and the potentially relevant output measures for each railroad) are assembled. Second, a relationship between the cost category and one or more output variables is postulated. Third, the relationship is tested by mathematically manipulating the postulated equation until the best “fit” between the data and the equation is achieved.

The RAPB reviewed three issues relating to the use of statistical analysis in GPCS:

- Variability Method (Cost Elasticity, Percent Variable, or Cost Coefficient).
- National vs. Individual Variability Measures.

- Equation Specification.

### VARIABILITY METHOD

A controversy exists as to the proper variability method to be used. At present, four different variability methods have been proposed:

- ICC Current Percent Variable (current ICC methodology in RFA).
- ICC Proposed Percent Variable (proposed ICC methodology in the URCS).
- Direct Coefficient Application.
- Cost Elasticity.

#### ICC Current Percent Variable

The percent variable method used by the ICC in current RFA costing computes the average percentage change in costs related to the average percentage change in the level of traffic (which is average cost elasticity). If an 8-percent change in cost was related to a 10-percent change in traffic, costs would be 80-percent variable. The calculation is based on cost elasticity at average densities.

#### ICC Proposed Percent Variable

The percent variable method proposed by the ICC in the URCS divides the variable portion of the

regression equation for cost by the value of the entire equation.<sup>60</sup> This method is used by Phase II of the URCS to compute the variable portion of an account group. It measures the percent of that annual total expense being incurred which can vary for an account group, a railroad, or a group of railroads.

### Direct Coefficient Application

Given a cost equation, for example,  $Y = a + bX$ , "b" represents the unit variable cost of output unit X. This method would multiply b times some value of output X involved in a movement to directly obtain an estimate of total variable cost for the movement. Similarly, for a nonlinear equation form, such as  $Y = a + bX + cX^2$ , this method would calculate the total variable cost as  $bX + cX^2$ . This method divides the total variable cost by units of output to get the average variable unit cost for any given output.

### Cost Elasticity

Cost elasticity employs the methods of differential calculus to determine the percent change in total cost given an infinitesimal change in output.<sup>61</sup> In the linear case, application of cost elasticity results in a value similar to the ICC-proposed percent variable. However, for nonlinear equation forms, cost elasticity and average percent variable methods arrive at different results.

### Analysis of Alternatives

The RAPB prefers the use of a cost elasticity approach for two reasons. First, the Causality Principle favors the use of either the cost elasticity or cost coefficient method to estimate accurately how costs change with respect to changes in output. Although either of the two percent variable approaches is acceptable for use with linear regression equations (as both produce results similar to

the cost elasticity method), neither measures accurately how costs change with respect to changes in output in nonlinear equations. Second, the RAPB has rejected use of the cost coefficient method for practicality reasons, due to its incompatibility with RFA and the URCS (see p. 96).

Cost elasticity appears to be more appropriate than average percent variable, when production economies are represented using nonlinear models. The cost elasticity method is used in many contemporary railroad costing equations using a nonlinear equation format (such as Wood (1983) or Downing (1986)). While the average percent variable method can be applied to quadratic equation forms, disagreements exist on how to apply it to the exponential equation form, as the exponents represent the elasticity measure without reference to an intercept term.

The analyst must use great care in applying artificial constraints (such as unity) on the elasticity levels for individual expense categories. For the railroad industry as a whole, which experiences generally increasing production economies, total output elasticity probably is not greater than unity. However, certain costs may rise at a greater percentage rate than output and thus have elasticity greater than unity. For example, fuel usage may have an elasticity greater than unity if an increase in output is accomplished via heavier trains (lower horsepower/weight ratios) or requires greater idling time (fuel is used without generating ton-miles).

Historically, a range between zero and 100 percent has been indicated by the ICC for all percents variable. The range limitation indicates that as total output increased, the change in cost could not vary by more than the percentage change in output, implying that the cost elasticity of variations in output is between zero and one. Conceptually, the upper boundary implies that total variable cost is,

<sup>60</sup>Given  $Y_i = a + bX_i$ , percent variable equals:

$$\frac{bX_i}{a + bX_i} \quad (\text{using individual railroad variabilities})$$

$$\frac{b\bar{X}}{a + b\bar{X}} \quad (\text{using national variabilities})$$

where  $\bar{X}$  is the arithmetic mean of individual railroads' annual output.

<sup>61</sup>The equation for elasticity is:

$$\frac{dY/dX}{Y/X}$$

by definition, no greater than total cost. This boundary represents the fact that, on a historical basis, the total of variable and constant cost cannot exceed reported expenses.

The direct coefficient application is the most straightforward way to apply the results of regression analysis to determine variable cost, thus avoiding the necessity of apportioning total expense into variable and constant portions. Thus, it eliminates the allocation process in Phase II of the URCS, which includes expenses not regressed and uses default percentages. However, the direct coefficient method is subject to more significant problems if the regression analysis is not precisely specified, and usually requires significantly more data than are presently reported to the ICC.

## **NATIONAL VS. INDIVIDUAL VARIABILITY MEASURES**

Theoretically, costs derived from an individual railroad's data are the most economically accurate measurements of that railroad's costs. If each individual Class I railroad in the country had an ICC-approved equation for use with its own data, the question of variability would be more straightforward: the variable costs for a given movement would be calculated from the individual railroad's data. Regulatory jurisdiction, as determined by the revenue-to-variable cost ratio, would also be quite straightforward.

According to the Causality and Data Integrity Principles, sufficient data points must be included in a regression analysis to assure statistical reliability. At the present time, sufficient data points can be collected practically only by pooling the data for all railroads on a national basis. According to the Practicality Principle, nationally pooled data can be used even though using individual railroad data would be more accurate because sufficient data are not otherwise available. If sufficient individual railroad time series data are accumulated in the future, such data should be used to calculate individual railroad regression equations.

While nationally pooled data can be used to estimate either individual or national cost elasticities (RFA uses national cost elasticities), RAPB research

indicates that cost elasticities should be applied on an individual basis, using the individual railroad's annual operating statistics. This process involves:

- Determining the functional form and coefficients of a regression equation based on nationally pooled data.
- Deriving a cost elasticity formula from this regression equation.
- Inserting the individual railroad's values for the independent variables in the cost elasticity formula.

The use of individual railroad variability may also pose an implementation problem for the jurisdictional threshold (based upon revenue-to-variable cost ratios).<sup>62</sup> It may require that individual revenue-to-variable cost ratio threshold tests be used so that the level of regulated traffic remains the same for each railroad as existed using RFA.

Opinions differ as to whether the Congress intended to set the proportion of traffic to be regulated on an individual carrier or aggregate basis. The RAPB is unable to find conclusive support for either opinion.

## **EQUATION SPECIFICATION**

The RAPB recommends that the ICC conduct additional analyses to incorporate specific density measures. The ICC should test size and density as independent variables as well as test alternative equation forms that measure production economies.

### **Traffic Density Measurement**

The treatment of size and density was the most significant criticism of the URCS equations received in comments. Individual railroad data are presently adjusted by the ICC, with a size deflator. In the ICC's view, this method also incorporates density. Some have argued that the size adjustment reduces the dispersion around the regression equation to a more manageable size and, therefore, may yield more statistically valid results.

Some have argued that not all data points should have equal importance in establishing a relationship between cost and output. In other words, they believe

<sup>62</sup>The present threshold is based on a nationally determined (RFA methodology) ratio established by the SRA.

that the larger carriers can have a greater importance in derivation of the cost equation than can the smaller carriers. Others have argued, however, that each railroad's observed data deserve the same weighting in the regression analysis as each observation represents equally valid information about the production function.

For a regression-based costing system to be theoretically justifiable, certain statistical assumptions must be made in the regression analysis. One assumption requires that, in the case of a function whose values increase markedly over the relevant range, the average difference between the data points and the regression line (at each level of output) remains the same (called homoscedasticity). Given the relation between railroad size and fixed cost and the fact that the average difference between data points and the regression line increases as size (and thus fixed cost) increases, this statistical assumption may be satisfied by incorporating a size deflating factor (dividing both expense and operating parameter data by a size variable).

Numerous studies have been conducted regarding the effect of economies of size (route-miles) and traffic density (net ton-miles per route-mile) on railroad costs. While the studies do not produce conclusive results, they suggest that economies of size (at least for Class I railroads) may be less significant than economies of traffic density. Regardless of the relative importance of size and density, virtually all studies agree that both size and density should be tested for significance in regression analysis. However, past studies have disagreed on the appropriate output variables and equation forms for use in relating size and density differences to cost changes. More studies on the specification of the various cost models are warranted to develop the most accurate cost estimates within practical limits.

Failure to include a causal variable in a model will lead to specification bias.<sup>63</sup> Specifically, it will lead directly to a biased (in an unknown direction) estimate of all regression coefficients which, in turn, implies that the variability estimates would also be biased in an unknown direction. Continuing efforts should be undertaken to examine equation forms which not only include size and density but which

also consider the effects of multiple output measures in an effort to avoid this type of bias.

On the other hand, the inclusion of more causal variables in a model will not always yield improved regression results. For example, in adding causal variables to a model, the degree of unreliability of individual coefficients may increase. Moreover, a simple regression form may be preferable to a more complex one which only slightly improves "goodness of fit."<sup>64</sup>

While economists generally consider density to be the most critical factor in determining variability for certain account groups, different views have been expressed regarding how density should be treated. The ICC states that the URCS includes both size and density measures. Others have stated that even though the URCS equations include size and density measures, economies of density are not included effectively. The RAPB recommends additional research should be undertaken to incorporate equations which allow economies of density to be measured where relevant.

According to Harris (1977, p. 557), economies of size have been confused with economies of density. Economies of size refer to a long-run average cost curve which becomes less steep as the size of the firm increases, that is, the larger the firm, the lower the incremental cost per unit of output.

Harris also states that size economies generally are not an issue for the general costing systems of Class I railroads, as such economies are presently in the size deflator. He says the critical determinant in pricing and investment policies is whether there are economies of density.

Both Griliches and Wood determined that the RFA methodology is a weak indicator of size economies. They believe, however, that this weak indicator is inconsequential since density (use) is the salient Class I railroad costing characteristic. Specifically, they are concerned about what happens to cost as output increases while holding the route system or miles of rail line constant. A small railroad with high traffic density may very well have lower incremental costs than a large railroad with low density.

<sup>63</sup>See Theil (1971), pp. 548-556, for a discussion of this effect for various model types.

<sup>64</sup>"Goodness of fit" is measured by the differences between the actual cost values for each reported level of output and the cost values predicted for those levels of output.

With economies of density, total costs will increase with increases in traffic, but the rate of the increase in costs (incremental or marginal costs) will be smaller as the level of traffic increases. Economies of density should not be confused with decreasing average costs caused simply by spreading fixed costs over a larger base. If the marginal or incremental costs do not change as traffic levels change, economies of density do not exist.

As noted above, most studies of railroad operations and costs strongly suggest that the influences on cost that result from economies of density are far greater than those that result from economies of size. Railroads with significant unused capacity, when faced with the choice of either doubling the density in their current plant or doubling their plant size while maintaining the same density, would choose the former. This choice assumes that the increase in density does not exceed available efficient capacity which may yield diseconomies.

### Equation Form

Because the regression equations are to represent the underlying economic relationship between cost and output, the proper equation form is critically important. As an example, if actual costs change as a function of size and density in a nonlinear manner, but only linear equations are used in regression analysis, then the actual nonlinearity of costs will never be discovered.

Curvilinear equations, equations with exponential coefficients for the independent variables, or linear equations with specific size and density variables may allow for better recognition of economies (or diseconomies) of density and size and should be tested. However, according to some, in a limited relevant range, equations that are linear with respect to the output term may be used to generate sufficiently accurate estimates.<sup>65</sup>

Many critics have analyzed the URCS equation forms (and by implication, the RFA equation forms). Some have criticized the lack of sophistication employed in the URCS regression formulations and have proposed alternatives. Daugherty and Turnquist (1980) have proposed other equation forms. While also proposing other equation forms, Friedlaender and

Spady (1980) have stressed collection of additional data to improve the regressions. Wood (1983) and Braeutigam and Swanson (1980) have suggested that less information would be sufficient to fulfill the purposes for which general purpose costing is to be used.

Equation forms may be divided into linear (or planar) and nonlinear. Linear forms involve a coefficient times the output variable where the output variable is raised to the first power:

$$Y = a + bX + cZ \text{ (planar or linear depending on whether or not the Z-term exists)}$$

Nonlinear forms express cost in terms of some function of one or more output variables, e.g., square root of the output variable, etc.:

$$Y = aM^bX^c \text{ (exponential)}$$

$$Y = a + bX + cX^2 \text{ (quadratic)}$$

The equation form itself may help reflect economies of output. Curvilinear equations and equations with exponential coefficients for the independent variables may allow for recognition of production economies (or diseconomies), whereas simple linear equations do not. For example, the quadratic form,  $Y = a + bX + cX^2$ , shows an effect of scale with the  $cX^2$  term. If "c" is a negative value, then the more output increases, the slower the rate of increase for total expenses.

In releasing the 1980 Railroad Cost Study (1982), the ICC published the equation forms it chose, stating that a "deductive" reasoning approach was used in selecting its equation form. Deductive reasoning uses previous knowledge of the variables consistent with the economic, engineering, and operational relationships theorized in the railroad industry.

### Linear Equations

The current equation form for each of the URCS cost equations is linear with respect to the output measure. The ICC believes that, while the relationship among the variables in the equations may not be strictly linear, the linear form closely

<sup>65</sup>The ICC staff has noted that its experimentation with nonlinear equation forms produced less significant results. The results of these experiments were not available for review by the RAPB staff.

approximates the "true" functional form. The ICC states that because data are reported for the carriers as a whole, rather than for individual cost centers, significant functional relationships may be masked due to data aggregation, thus resulting in a significant bias in the data.<sup>66</sup> That is, while a data base using cost center information might best be represented with a curved line, regression equations based on data for all railroads as a whole might best be represented with a straight line.

## Nonlinear Equations

This section presents information regarding two of the more commonly used nonlinear equation forms, exponential and quadratic.

### Exponential Equation Form

The exponential equation form (also known as the logarithmic form since the exponential form reduces to the logarithmic form using standard rules of logarithms) is structured as follows:

$$Y = aM^bX^c$$

where Y = total cost

a = constant term

M = size variable

b = exponent of size variable

X = density variable

c = exponent of density variable

One group recommended this equation form, stating that it has the advantage of reflecting economies of scale with exponents of less than one for the density variable (cost increasing by less and less as output increases). Others state that the exponential form results in bias to the equations.

Since current URCS equations relate costs to a density variable in a linear relationship, costs increase by the same amount for a given increase in output

within the range of Class I railroads which are represented in the URCS regression analysis.

A commenter proposes another innovation for the independent variables used in the URCS (for gross ton-miles, car-miles, locomotive unit-miles, etc. as output variables). The URCS uses miles of road as a size variable in URCS equations along with the aforementioned "density" variables. The commenter states that the "density" variables are products of a true density variable and a size variable; thus, the size variable and the URCS "density" variable are highly correlated. This correlation may reduce the statistical significance of the coefficients of the independent variables.

This commenter's proposed solution is to divide the URCS "density" variable by the size variable which already is incorporated in it. As an example, the commenter would divide gross ton-miles by miles of road to arrive at gross tons.

### Quadratic Equation Forms

Quadratic equation forms involve a linear output variable and that same output variable raised to the second power:

$$Y = a + bX + cX^2$$

where Y = total cost

a = a constant or a constant times a size variable raised to some power

X = output variable

b,c = coefficients

As described above, the  $cX^2$  term allows for the effects of scale, size, or density economies. For example, if "c" is negative, as output increases, the rate of increase declines, indicating economies of scale. If "c" is positive, the rate of increase accelerates (given simultaneous equal increases in output) indicating diseconomies of scale.

<sup>66</sup>ICC Preliminary 1979 Rail Cost Study (1981), p. 39.

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# CHAPTER 18

## Information Requirements

This chapter discusses the combined impact of the Principles on the three types of information required for GPCS:

- Regularly reported information.
- Special study information.
- Productivity information.

### REGULARLY REPORTED INFORMATION

The RAPB believes that present reporting practices (the R-1) are adequate at this time to fulfill the requirements of GPCS. However, it believes that refinements in reporting information would enhance the accuracy of costing information.

The Practicality Principle indicates that present reporting should be maintained because of the limited use made of GPCS and because the cost associated with implementing any reporting changes appears to be greater than the benefits which would be derived from improved accuracy. For applications requiring greater accuracy than GPCS can provide, special studies (which yield the most accurate costs) should be used.

No modifications of the reporting requirements need be made at this time. Should any modifications to

reporting requirements be made in the future, the Causality, Homogeneity, Practicality, and Data Integrity Principles should provide guidance concerning such changes. In making any modifications, the ICC should consider relevant research and public comment.

Under current circumstances, R-1 reporting is consistent with the Practicality Principle, even though immaterial or little-used information may be reported.

### Current Information Requirements

The ICC requires a significant amount of information from either individual railroads or the AAR, including

- R-1 reports,
- other publicly available reports, and
- reports with restricted availability.

To collect this information on a comparable basis, the ICC has prescribed a mandatory accounting system, the USOA.

The railroads generally collect data using an internal managerial accounting system. To fulfill regulatory requirements, they use a "conversion matrix" to assign costs from the managerial system to the USOA. (The conversion procedures are based on

studies that generally were performed at the time of conversion to the current USOA (1978).) Typically, railroads' operating or accounting departments prepare operating statistics. Operating departments record data from various field operations, whereas accounting departments often derive data from recorded revenue statistics. Some railroads use estimates in reporting operating information. In many cases, individual railroads have developed different definitions for particular statistics. Theoretically, such differences could make the statistics unusable for comparisons among railroads. However, the effects have not been demonstrated to date.

### **R-1 Reports**

Railroads are required to submit R-1 reports to the ICC. The R-1 report contains information reported in USOA format and prepared in accordance with ICC-prescribed procedures. It comprises 52 separate schedules, summarized in 4 schedules:

- Schedule 200. "Comparative Statement of Financial Position," an analysis of a railroad's balance sheet items.
- Schedule 210. "Results of Operations," a historically based income statement.
- Schedule 410. "Railway Operating Expenses," a detailed report which serves as cost input to the URCS (A2 worktable).
- Schedule 755. "Railroad Operating Statistics," a summary which is the basic source of output measures used in the regulatory cost systems.

Expenses in Schedule 410 are divided into functional and natural account groups for annual reporting. Functional accounts relate to specific railroad functions and generally conform to the organizational structure of railroads. Each functional account is divided into four natural accounts: salaries and wages, materials and supplies, purchased services, and general.

### **Other Publicly Available Reports**

In addition to the R-1 report, the ICC receives other reports:

- CS-54 Report. Produced by the AAR; contains revenue and carload information by car type.

- Freight Commodity Statistics. Contains annual carload and tonnage information by car type and traffic type (originated, terminated, received, and forwarded).
- Quarterly Commodity Statistics. Contains the same information as the Freight Commodity Statistics report, but on a quarterly basis.
- Loss and Damage Report. Contains loss and damage costs by commodity type.
- Railroad Cost Recovery. Prepared by the AAR from information reported by member railroads; contains price indices of various inputs on both a regional and national basis. (A forecast version is used as the source for issuing the RCAF as a national index for railroad rates.)
- Switching and Terminal Company Reports. Contains revenue and cost information for each switching and terminal company on services performed for Class I railroads.

### **Reports with Restricted Availability**

In addition to the publicly available reports, information is collected that is not publicly available. One example is the ICC Waybill Sample.

A waybill is a routing and billing document that includes origin and destination stations, lading weight, carriers in the route, commodity, and the published tariff freight rate. The ICC Waybill Sample is prepared by a contractor for determining, among other things, the Cost Recovery Percentage. The sample is considered confidential, with ICC approval required for access to the data. Access is granted on a case-by-case basis, but a limited public-use file is available without restriction.

### **Alternative Reporting Requirements Considered**

The three alternatives considered and rejected are:

- Require geographic/density cost center reporting.
- Require more detailed equipment cost center reporting.
- Eliminate the reporting of certain information.

### **Geographic/Density Cost Center**

More homogeneous cost information may be obtained by dividing a railroad entity into smaller units that have common operating features. One alternative is to subdivide the railroad into discrete geographic areas, while another alternative is to subdivide the railroad into several density categories to collect data. The two alternatives are presented jointly as they seek to capture the same causal relationship; only one would be selected.

Certain cost information may be more homogeneous at a level lower than the entity. For example, Transportation and Way and Structure expense groups—which comprised 65 percent of total U.S. Class I railway operating expenses in 1984<sup>67</sup>—are considered to be affected by density. Cost information can be collected on the basis of line density (operating) statistics. By using cost centers based on geographic areas with similar operating characteristics or density, a greater homogeneity of cost-pooled data may be established.

Applying cost center accounting data can help identify line-specific (as opposed to average) movement costs of a railroad. However, this alternative may be difficult to implement for those railroads with less sophisticated management information systems.

**Geographic Cost Center.** Scher (1963) noted, in a study for the French National Railway, that the differentiation of lines according to their operating and financial data in a fixed operating environment (i.e., geographic cost centers) produced the following conclusions:

- To use only those factors related to traffic.
- To distinguish between long-haul traffic and local traffic, including switching.
- To compute unit costs for the various lines by relating them to the gross ton-miles hauled.
- To restrict computations to regular movements, which represent 90 percent of the French National Railway's total traffic.

Thus, Scher found that speed-related information as well as time and geographic data were important

to establish the nonlinearity of costs. Such cost information can be derived from geographic cost centers.

With a flexible definition of cost centers, railroads would be able to use the cost center concept in the same manner as they keep their accounting systems. Some railroads are presently organized into geographic cost centers to capture information for internal cost analysis. The ICC, in Docket No. 37203, considered requiring railroads to keep cost center information at least at the same level of detail as they presently maintain in their own internal accounting systems.

As a corollary to the geographic cost center accounting functional data requirements, the Canadian Transport Commission (1984) and the French National Railways (Scher, 1963) used transit time and geographic area data as a means to establish greater cost pool homogeneity and to help establish actual transit times for movement costing. The Canadian Transport Commission, through its GPCS, includes sufficient reported detail to permit estimation of variable expenses for different types of equipment, operating conditions, and geographic locations.

**Density Cost Center.** The other method to capture more homogeneous data is to subdivide accounts which identify differences in cost attributable to economies of traffic density. Certain maintenance-of-way and transportation accounts may be disaggregated into subcategories of line densities. Specifically, certain running and transportation accounts may be disaggregated into various densities to help develop more specific unit costs.

The major constraints to adopting density cost centers are the (1) cost of reporting, (2) homogeneity of the data collected, and (3) circularity in definition of the cost center. The cost of reporting would increase if density cost center information were collected, although not as much as if geographic cost center information were collected. The homogeneity of the data collected with respect to weather, topography, and speed would also be reduced. Circularity would exist if the definition of the cost center (based on year-end operating statistics) pre-

<sup>67</sup>From ICC *Transport Statistics in the United States for 1984* (1985).

cludes classifying operating statistics and expenses on a timely basis.

Reporting of certain accounting information by line density would also require disaggregation of operating statistics in sufficient detail to generate unit costs.

### **Detailed Equipment Cost Centers**

Equipment (locomotives and freight cars) expense groups—which comprised 25 percent of total U.S. Class I railway operating expenses in 1984—are largely comprised of costs common to the entire entity. They are not subject to identification and assignment on a geographical basis on most railroads, since equipment is not normally dedicated to a single operating division.

The equipment may be divided into cost centers which capture differences related to the use of different types of equipment for specific commodities. Further refinement of equipment costs into more specific equipment categories is appropriate only if the equipment may be identified with specific shipments and the equipment cannot be used interchangeably with other equipment.

Presently, the parties use special study information on specific equipment used for particular movements. To require equipment type cost centers that would provide the same level of refinement obtainable through special study appears impractical.

### **Elimination of Reporting of Certain Information**

Elimination of reporting of certain information reduces the reporting burden placed on railroads and simplifies the costing process. However, elimination of reporting requires implementing changes, the cost of which may outweigh any cost savings associated with reduced reporting.

Whether the USOA is modified at a later date to provide less accounting and operating detail depends in part on the regulatory importance of individual R-1 schedules. Many schedules have limited use. They include 220 (retained earnings), 230 (capital stock), 240 (statement of changes in financial position), 310 (investments and advances in affiliated companies), 339 (accrued liability-leased property), 340 (depreciation base and rates improvements to road and equipment leased to others), 501 (guar-

antees and suretyships), and 502 (compensating balances and short-term borrowing arrangements).

The current USOA is a compromise between the completely new version initially prepared by the ICC Bureau of Accounts in 1977 and the AAR Cost Analysis Organization's (CAO's) proposal to modify the old USOA. The USOA information requirements were established before the URCS had been designed due to time constraints associated with the implementation of the URCS. The ICC relied on its experience and the collective experience of the CAO, shippers and shipper groups, and consultants.

The current USOA requires significantly more information than the old USOA. The current USOA (Schedule 410) requires 216 line items for freight service expenses, subdivided into four natural categories, or 758 account elements. The old USOA (Schedule 320) required 154 line items for freight service expenses, most subdivided into three categories, or 409 account elements.

While the number of account elements reported has increased significantly, all elements are not equally important. Account elements for all the Class I railroads combined in 1983 are analyzed in the table below.

DISTRIBUTION OF 1983 SCHEDULE 410 LINE ACCOUNTS, BY PERCENT OF TOTAL FREIGHT DOLLARS

|             | Number of Account Elements |            |                    |            | Total Freight |
|-------------|----------------------------|------------|--------------------|------------|---------------|
|             | Labor                      | Material   | Purchased Services | General    |               |
| NA          | 97                         | 97         | 36                 | 64         | 0             |
| 0 to .01%   | 25                         | 60         | 64                 | 79         | 27            |
| .01 to .05% | 35                         | 37         | 60                 | 31         | 48            |
| .05 to .1%  | 10                         | 6          | 16                 | 12         | 31            |
| .1 to 1%    | 40                         | 12         | 36                 | 24         | 88            |
| Over 1%     | 9                          | 4          | 4                  | 6          | 22            |
| Total       | <u>216</u>                 | <u>216</u> | <u>216</u>         | <u>216</u> | <u>216</u>    |

A number of account elements have no costing requirement. A large number of accounts fall in the 0 to .01 percent and the .01 to .05 percent categories, all of which are insignificant from a costing viewpoint. Because, on individual roads, the percentage of expenses in some categories may be higher compared to the industry average, many individual account elements make no meaningful contribution unless financial or other justification exists.

Grouping insignificant account elements may simplify the current USOA without compromising the URCS unit cost development. In the URCS analysis, account elements associated with each independent output variable are combined to analyze variability. While the effects have not been measured, grouping the associated account elements in the current USOA would not appear to affect the results of the URCS analysis.

If URCS processing is simplified by reducing account elements, the URCS may be easier to work with and more efficient to operate. Working with fewer account elements may make the URCS information easier to adjust for specific movements. Processing fewer account elements may make the URCS program easier to modify so that other costing issues (e.g., density information) may be addressed.

## **SPECIAL STUDY INFORMATION**

The current USOA requires that certain information be estimated for special studies, including (1) accounting allocation studies to allocate costs to different output measures and (2) output estimation studies to estimate output measures not publicly reported.

If study information becomes dated and necessary follow-up studies are not performed, the study information may contain incorrect information.

The remainder of this section identifies potential problem areas which the ICC may need to address.

### **Accounting Allocation Studies**

The railroads generally collect data using an internal managerial accounting system. To fulfill regulatory requirements, they use a "conversion matrix" to assign costs from the managerial system to the USOA. (The conversion procedures are based on studies that generally were performed at the time of conversion to the current USOA (1978).) To remain valid, the railroads and the ICC should periodically update these studies.

### **Output Estimation Studies**

Certain output measures are not reported to the ICC for reasons of practicality: they are computed by the ICC as either constant factors which are the

result of special studies or as factors which are updated from annual statistics following a prescribed methodology. Significant operating statistics computed in this manner include equated switching factors, station study factors, car day factors, and circuitry factors.

The special studies which are the foundation for the constant factors were undertaken by or presented to the ICC in various proceedings during the 1930's through the 1960's. Similarly, most of the methodologies used to update the remaining parameters were developed during this same period.

Many of the output measures were accepted by the ICC staff in November 1963, in Statement 7-63, *Explanation of Rail Cost Finding Procedures and Principles Relating to the Use of Costs*. These parameters were incorporated into RFA at that time and have subsequently been accepted by the ICC staff for use in the URCS.

The vintage of the studies causes concern regarding their accuracy for allocation of costs. The ICC, to comply with the Causality and Data Integrity Principles, should update these studies.

## **PRODUCTIVITY INFORMATION**

The Productivity Principle indicates that, when practical, an appropriate productivity adjustment should be included in cost indices to measure cost changes accurately. Measures of cost changes are used in general-purpose costs in two ways:

- To adjust the pooled data used in regression analysis to a common base year.
- To adjust output unit cost data to a more current period.

### **Adjust Pooled Data**

GPCS, such as the URCS, use multiple-year expenses for each railroad to formulate regression equations and to "normalize" multiple-year maintenance expenses in the establishment of variabilities and unit costs. Before the analysis is undertaken to produce the "best fit" equations, the URCS adjusts the time-series data to a common base year to achieve comparability and to avoid differentiation due to inflation.

A cost relationship, implicitly defined, is the relationship between input resources required and output produced. Productivity—a measure of the resources required to produce an output—may, over time, affect the costing process.

A possible treatment for changes in productivity is the use of productivity indices. Another treatment is to incorporate a time-series variable into the regression equations to measure the changes in productivity that occur.

### **Adjust Unit Cost Data**

Indices used to update GPCS unit costs should account for productivity changes over the period for which they are applied. For example, indices may be applied to GPCS unit costs, based on 1984 expenses and operating statistics, to calculate

movement costs as of the third quarter of 1986. To estimate the movement's costs properly, the indices applied to the 1984-based unit costs must account for productivity changes in addition to the average inflation experienced from 1984 to the third quarter of 1986.

The magnitude of change in unit costs that would result is not clear, as the information available is inconclusive. The AAR has stated that the changes from incorporating a productivity adjustment in GPCS would not be material. One shipper group commented that incorporating a productivity adjustment may be an impractical refinement in certain circumstances (indicating low materiality). However, another shipper group indicated the results of such an adjustment would be material and, therefore, worth doing.

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# GLOSSARY

The glossary contains terms widely used in the report. Terms not widely used are defined in footnotes.

Definitions are intended to comport with practice in the railroad industry. Of necessity, however, terms have been defined to meet the requirements of this document. Hence, definitions may not be identical to definitions used by the ICC or others.

**Acquisition Cost** The value of the resources forgone to acquire assets. For all assets acquired through a business combination, acquisition cost is the lower of (1) the aggregate purchase price of the firm or (2) the fair value of the tangible and identifiable intangible assets at the time of the business combination. (Related terms are historical cost of an asset, GAAP cost, and predecessor cost.)

**Average Variable Cost** (or Variable Unit Cost) Variable cost divided by the number of units of output. (Related terms are variable and fixed cost.)

**Avoidable Cost** Cost that would be eliminated by the discontinuance of a particular activity over the relevant time frame.

**Capacity Costs** The costs of the resources used to provide or maintain current operating capacity.

**Car-Mile** The movement of a car a distance of one mile, often aggregated into total car-miles, loaded car-miles, and empty car-miles.

**Cost of Capital** The return on investment required to attract and retain capital in amounts adequate to provide a sound transportation system.

**Cost Objective** The result of the use of resources.

**Current Market Value** The market value of assets as measured by reproduction cost, replacement cost, or net liquidation value. (Related terms are reproduction cost, replacement cost, and net liquidation value.)

**Current Nominal Cost-of-Capital Rate** This rate of return represents the weighted average and current costs of debt and equity, and includes compensation for the anticipated effects of inflation. (A related term is real cost-of-capital rate.)

**Engineered Cost** A cost estimate derived from engineering or physical studies of resource consumption.

**Excess Assets** Assets which could be excluded, separated, or disposed of by the business entity without adversely affecting its ability to meet normal fluctuations in the demand for its services.

**Fixed Cost** Cost that is invariant with respect to the level of output. Fixed cost represents the difference between total cost and total variable cost.

**Fully Allocated Cost** Cost that includes both the variable cost of the service and the fixed cost (including a provision for the cost of capital necessary to provide the service) allocable to the service.

**GAAP Cost** As used in this report, the value of the resources forgone by the entity to acquire the assets. GAAP cost, as applied in business combinations, is acquisition cost except in a "pooling of interests." GAAP cost is the net book values of the pooling entities. (Related terms are acquisition cost, predecessor cost, and historical cost of an asset.)

**Gross Ton-Mile** The movement of one ton of transportation equipment and its contents a distance of one mile.

**Historical Cost of an Asset** The amount of cash (or its equivalent) paid to acquire an asset. Historical cost may be adjusted for depreciation and amortization. (Related terms are acquisition cost, GAAP cost, and predecessor cost.)

**Holding Gains (and Losses)** The increase (or decrease) in an asset's current market value during a specified period.

**Incremental Cost** The change in cost that results from a management decision.

**Incumbent Railroad** A railroad which already owns and/or possesses exclusive right of way over a specific line or network.

**Intermediate Run** A time period during which some but not all capacity-limiting input factors may be changed.

**Joint (or Through) Rate** A freight rate covering a movement that involves more than one carrier. The published rate covers origin to destination. All participating carriers divide the total payment on the basis of agreed proportions.

**Jurisdictional Threshold** The percentage of revenue-to-variable cost above which the ICC has jurisdiction to consider the reasonableness of rail freight rates of a market dominant rail carrier.

**Long-Cannon Factors** Statutory requirements that the ICC must consider in rate reasonableness cases. Specifically, the factors involve ICC consideration of (1) the amount of the carrier's traffic that fails to contribute to the going concern value and the carrier's efforts to minimize such traffic, (2) the amount of traffic contributing only marginally to fixed costs and the extent to which rates on such traffic can be increased, and (3) the carrier's mix of rail traffic to determine whether one commodity is paying an unreasonable share of the carrier's revenue.

**Long-Run Average Cost** The average unit cost of service under the assumption that all inputs are variable. The long-run average cost curve defines, for each level of demand, the average unit cost of service of an efficiently sized plant.

**Long Run** A period of time long enough to permit changes in all capacity-limiting input factors.

**Movement-Specific Costs** Costs for an individual movement from origin to destination, including a portion of the cost of returning the empty equipment. Movement-specific costs are often contrasted with the system-wide average costs developed by a general-purpose costing system such as the URCS.

**Net Liquidation Value** The current price at which an asset could be sold net of costs necessary to obtain that price, or the net amount of funds that could be realized from disposing of the asset. (Related terms are current market value, replacement cost, and reproduction cost.)

**Opportunity Cost** The value of the cash flows that must be forgone if a resource is diverted from its best alternative use.

**Percent Variable** The proportion of the costs in an account or a group of accounts that can be shown to be variable with the level of output.

**Pooled Analysis** A statistical process that uses both cross-sectional and time-series data points in regression analysis.

**Predecessor Cost** The cost to the entity first devoting the property to public service. (Related terms are acquisition cost, GAAP cost, and historical cost of an asset.)

**Rail Form A** A costing methodology developed by the ICC to attribute variable costs to service units for movement costing. The methodology attributes costs based on accounting data, special studies, related operating statistics, and regression analysis performed on historical data supplied by individual railroads. The same allocation percentages are applied to all carriers and all regions.

**Real Cost-of-Capital Rate** The cost-of-capital rate excluding the effects of inflation. (A related term is current nominal cost-of-capital.)

**Regression Analysis** A computational process that develops a mathematical relationship between a dependent variable (usually cost) and one or more explanatory variables (usually measures of output). The dependent variable is stated in the form of an equation as a function of the explanatory variable(s).

**Replacement Cost** The amount of cash (or its equivalent) that would have to be paid to acquire currently the best asset available to undertake the function of the asset owned (after depreciation or amortization if appropriate). The measurement of the replacement cost of an asset, however, must be consistent with the treatment of operating expenses related to that asset (depreciation and maintenance, for example). Consequently, if the operating

expenses generated by existing assets are used, replacement cost must be measured by the cost of replacing the service potential of the existing assets. That measurement would require adjusting the cost of the best asset available for operating advantages or disadvantages of the asset owned. (Related terms are current market value, reproduction cost, and net liquidation value.)

**Reproduction Cost** The current cost of duplicating exactly the asset(s) in question. (Related terms are current market value, replacement cost, and net liquidation value.)

**Retirement-Replacement-Betterment Accounting** A method of accounting for track structures under which the costs of installing track are capitalized, not depreciated, and remain capitalized until the track structure is removed from service. The costs of replacing track are expensed unless a betterment occurs. In that case, the amount by which the cost of the new part exceeds the current cost of the part replaced is considered a betterment and is capitalized but not depreciated, and the current cost of the part replaced is expensed.

**Revenue Adequacy** The level at which revenues from railroad operations provide a return on investment necessary to maintain the rail system and to attract debt and equity capital.

**Service Unit** An operating statistic used to measure the output of a service.

**Short Run** The period of time during which capacity-limiting input factors are fixed. (Related terms are intermediate run and long run.)

**Size Deflation** A technique used in regression analysis to adjust for differences in size among railroads. Cost equations are divided by a measure of railroad size so that costs can be expressed on a common unit basis.

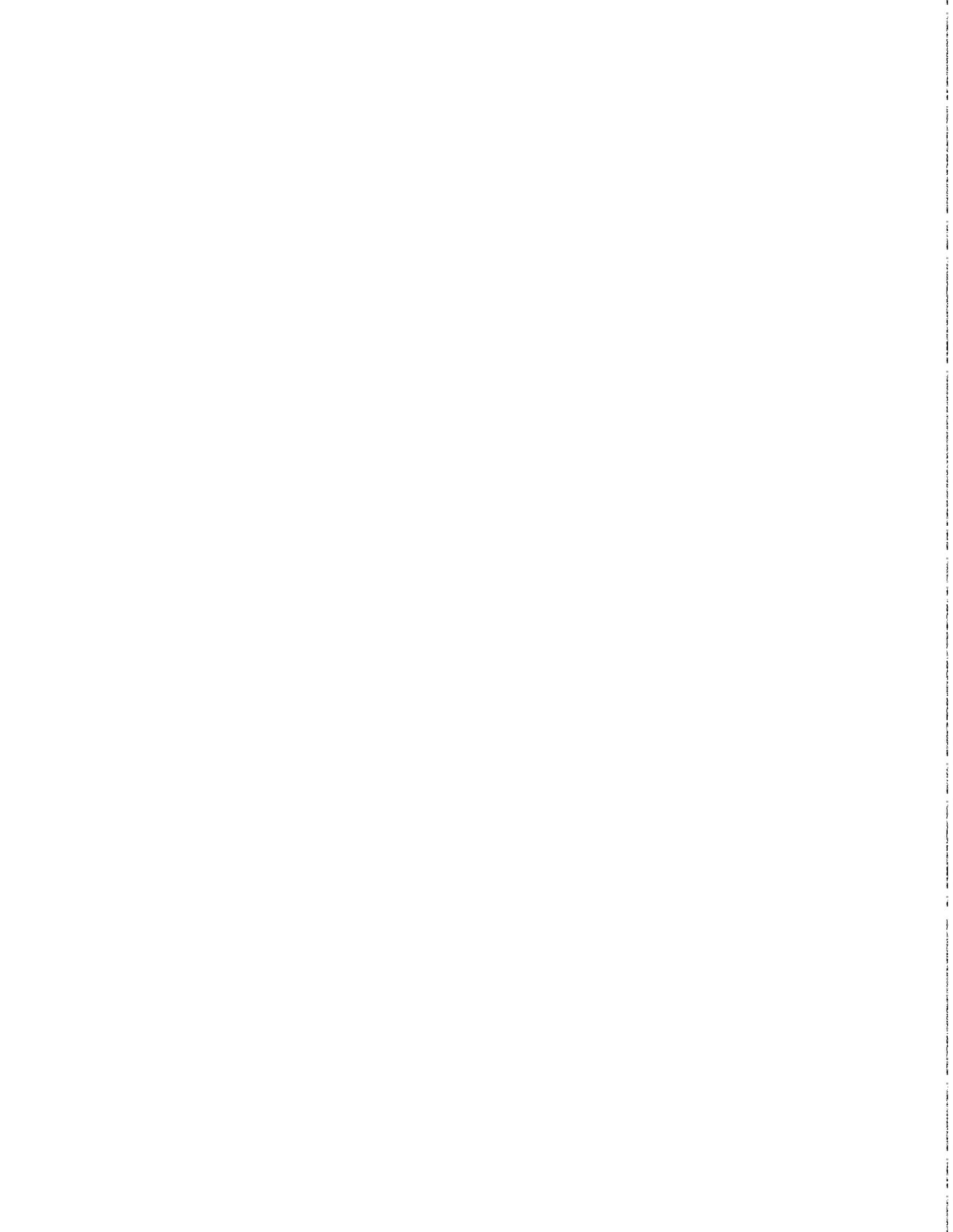
**Stand-Alone Cost** The total hypothetical cost a shipper or third party would incur to construct and operate a rail line or otherwise provide necessary transportation services to a defined group of shippers including itself.

**Transfer Pricing** The pricing of transactions between related parties.

**Uniform Rail Costing System (URCS)** A regulatory costing system that attributes variable costs to operating statistics using R-I data and regression techniques. The URCS uses the USOA (up to five years of data) in the calculation of unit costs and calculates a separate variability in each account for each carrier and region on the basis of its activity.

**Uniform System of Accounts (USOA)** The chart of accounts required for reporting to the ICC for regulatory purposes.

**Variable Cost** Cost that varies with levels of output within a particular time frame.



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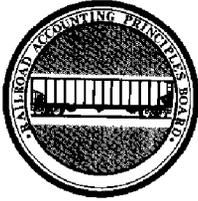
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# APPENDIX



RAILROAD ACCOUNTING PRINCIPLES BOARD

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**Memorandum**

Date: June 29, 1987

To: Chairman, Railroad Accounting Principles Board

From: General Counsel - Jeffrey A. Jacobson *JAG*

Subject: Scope of Authority of the Railroad Accounting Principles Board

This memorandum responds to arguments that the Railroad Accounting Principles Board has exceeded the authority provided it by the Staggers Rail Act of 1980, Pub. L. No. 96-448, 94 Stat. 1895 (1980) (the "Act"), in some of the eight principles proposed in its exposure draft of February 20, 1987. Challenges to the Board's authority were made in public comments and at a public hearing on the proposed principles.

One of the goals of the Act is a limited regulatory process that balances the needs of carriers, shippers, and the public. Toward this end, Congress declared a national policy for rail transportation that includes ensuring the availability of accurate cost information in regulatory proceedings (49 U.S.C. § 10101a), and created the Railroad Accounting Principles Board to establish principles to govern the determination of all costs for regulatory proceedings before the Interstate Commerce Commission (ICC).<sup>1/</sup> The Board's principles are to be implemented

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<sup>1/</sup> Section 11162 of title 49, United States Code, provides, in pertinent part:

"(a) \* \* \* the Railroad Accounting Principles Board shall establish . . . principles governing the determination of economically accurate railroad costs directly and indirectly associated with particular movements of goods, including the variable costs associated with particular movements of goods or such other costs as the Board believes most accurately represent the economic costs of such movements. Such principles shall govern the determination of all railroad costs for specific regulatory proceedings

through rulemaking by the ICC consistent with the procedural and substantive requirements of the rule-making process. 49 U.S.C. § 11163. The ICC is responsible for maintaining and revising the standards, rules, and procedures needed for rate-making and other regulatory purposes. See e.g., 49 U.S.C. §§ 10701(e); 10704(a)(2). As discussed in detail below, the cost principles proposed by the Board include principles for determining the relevant railroad entity involved, the cost of capital, and the valuation of assets and related expenses, and a principle providing that an accurate measure of cost changes must reflect changes in productivity.

The challengers essentially make three arguments in support of their challenge that the Board has exceeded its authority in these four areas. First, they assert that the Board is restrained by the Act from establishing principles to govern ICC cost determinations in regulatory proceedings that do not involve particular movements of goods. Second, they challenge some principles on the basis that they address regulatory policy and rate-making issues and thus infringe on the exclusive statutory authority of the ICC. Finally, the challengers assert that the Board has not supported

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under this title.

"(b) In developing cost accounting principles under this section, the Board shall take into account the following considerations:

- (1) The specific regulatory purposes for which railroad costs are required.
- (2) The degree of accuracy of the cost information which is needed to meet regulatory purposes.
- (3) The existing capability and the probably future capability of rail carriers to provide such information and the relative benefits and costs of requiring development of additional capability.
- (4) The means by which the degree of economic accuracy required can be obtained at the least possible information reporting.
- (5) The means by which the confidentiality of such costs can best be maintained while meeting the need for such information in regulatory proceedings."

these principles with the type of cost-benefit analysis required by the Act.

For the reasons stated below, we conclude that the principles proposed by the Board may govern the determination of all costs in ICC regulatory proceedings because, as contemplated by the Act, those costs are associated with particular movements of goods. The Board in establishing principles for the determination of costs is not assuming the regulatory policy or rate-making responsibilities of the ICC. Finally, the Board has considered the costs and benefits of the proposed principles consistent with the requirements of the Act.

#### BACKGROUND

The Act provided for establishing the Board but funds were not appropriated until 1984. After the Board received an appropriation, one of its first acts was to invite the public to comment on the issues the Board should address. 50 Fed. Reg. 7153 (February 20, 1985). The Board subsequently issued a discussion memorandum for public comment which presented a series of issues and questions relevant to the development of cost accounting principles. 51 Fed. Reg. 4050 (January 31, 1986). The process of developing cost accounting principles culminated with the Board's issuing an exposure draft on February 20, 1987. The Board invited the public to comment on the exposure draft and to testify at a public hearing. 52 Fed. Reg. 5361 (Feb. 20, 1987).

The draft proposes eight principles. For each there is a statement of principle, an explanation, and an application section which describes how the principle affects cost determinations in relevant regulatory proceedings. Four of the principles are characterized as "general" principles because they apply to all cost determinations. They are referred to as principles of causality, homogeneity, practicality, and data integrity and are not here in dispute.<sup>2/</sup>

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<sup>2/</sup> However, the necessary implication of the assertion that the Board is prohibited from establishing principles to govern cost determinations in regulatory proceedings that do not involve particular movements of goods is that the Board must delete from the application section of the general principles all discussion of their application to regulatory proceedings which involve other than movement costs.

The other four principles are characterized as "specific" because each pertains to a particular kind of determination. They seek to establish the railroad entity involved, the cost of capital, and the valuation of assets and related expense, and to recognize productivity changes. An entity principle is fundamental to the Board's work for it defines the railroad-related activities for which cost determinations are made. The principles for cost of capital, asset valuation, and productivity adjustment will govern determinations of cost and cost changes which the ICC is required to make in its regulatory proceedings.

An understanding of various ICC proceedings and the relevance of specific principles to them is essential.

"Revenue adequacy" determinations arise from a requirement in the Interstate Commerce Act that the ICC determine annually which railroads subject to its jurisdiction are earning adequate revenues. The Act provides that adequate revenue levels should provide for the recovery of expenses and the attraction and retention of necessary capital for continued operations. The ICC has adopted a revenue adequacy standard which provides that a railroad has adequate revenues when its return on investment equals or exceeds the cost-of-capital rate computed annually by the ICC. The aggregate cost elements of the revenue adequacy standard are the cost of capital rate against which the return on investment is compared and the value of the assets used in calculating return on investment. The cost of capital and the asset valuation principles provide for determining the corresponding aggregate cost elements. The entity principle provides for determining the railroad-related activities whose assets should be valued.

"Maximum rate" proceedings are conducted by the ICC to determine whether a rate is within the statutory ceiling, i.e., does not exceed a reasonable maximum. The ICC has determined that a rate exceeds a reasonable maximum if the rate would attract competition by covering the costs a new competitor would incur to enter the market. To make this determination in cases involving movements of coal, the ICC adopted stand-alone cost as the appropriate regulatory standard. Stand-alone cost is the cost at which a hypothetical efficient competitor, in a market free of special entry and exit barrier costs, could provide the service covered by a challenged rate. As such, it acts as a constraint on rates by being the reasonable maximum rate above which a railroad may not charge. The Board's cost of capital and asset valuation principles are applicable in determining the costs a hypothetical competitor would incur to provide service. The entity principle serves to define the transportation network of the hypothetical competitor

for purposes of identifying the assets to be included in the stand-alone cost calculation.

"Abandonment" proceedings are conducted when a railroad system seeks ICC approval to abandon a line over which goods are moved because the line is earning insufficient revenues. The ICC has defined the relevant costs for evaluating whether the line is earning insufficient revenues, as well as the effect of an abandonment on the railroad system. The relevant costs are the aggregate costs that could be avoided by the railroad if the line is abandoned, including the opportunity cost of maintaining service, and the variable costs associated with movements originating or terminating on the branch line which are incurred on the railroad's other lines. The cost of capital and the asset valuation principles are to be used to determine opportunity costs. The entity principle serves to define the lines for which avoidable costs must be determined.

"Competitive access" is the providing of service to shippers by more than one railroad. To obtain competition, the ICC may require a railroad to provide switching service for another railroad (reciprocal switching) or grant rights to one railroad to operate over the tracks of another railroad (trackage rights). The ICC also may deny joint rate/route cancellations. In reciprocal switching and trackage rights cases, the ICC determines compensation for the railroad providing access if the parties fail to agree. To make this determination, the ICC typically considers, among other things, incremental costs that in the aggregate are associated with the additional use of the facilities and services provided. The cost of capital and the asset valuation principles serve to determine the incremental costs in reciprocal switching and trackage rights cases. The entity principle serves to define that part of the railroad system affected by the granting of competitive access. In joint rate/route cancellation cases, the ICC typically considers average variable costs in determining relative efficiencies of alternative routes. Variable costs are developed from a general purpose costing system. The principles address these costs to the extent they affect the costing system.

The "rail cost adjustment factor" (RCAF) is a mechanism for increasing rates without the increase being subject to a rate-making proceeding. The RCAF is intended to represent aggregate inflationary cost increases. It currently measures changes in prices by using an index of industry-wide railroad prices on such components as labor, fuel, materials and supplies, among others. The RCAF does not reflect changes in productivity. The Board's productivity principle provides that in order to measure aggregate cost

changes accurately, changes in productivity, as well as prices, must be reflected in indices used for regulatory purposes.

#### ANALYSIS

##### Application Of The Proposed Principles

The first sentence of 49 U.S.C. § 11162(a) requires the Board to establish principles to determine "economically accurate railroad costs directly and indirectly associated with particular movements of goods, . . . ." The challengers rely on this sentence for the proposition that Board principles are applicable only to proceedings which involve the determination of individual movement costs. That sentence, unlike the one following it that challengers ignore, contains no reference whatever to the proceedings to which the principles might apply. Instead it only provides that the principles shall address costs associated, directly or indirectly, with particular movements of goods. Challengers would have us infer from the first sentence of section 11162(a) that principles for costs associated with particular, or as they would further have it, with individual movements of goods, are not for application in ICC proceedings unless these proceedings would involve determining costs associated with the individual movement of goods. They therefore assert that, since the Board has provided for applying its principles to proceedings where costs are determined on an aggregate basis (e.g., revenue adequacy, abandonment, competitive access and RCAF proceedings), the Board has exceeded its authority. Its authority to address application of its principles is constrained, in their view, to those proceedings where costs are not determined by the ICC on an aggregate basis, but instead are associated with individual movements. Challengers insist that aggregate costs are not even indirectly associated with individual movements.

We believe, first, that the challengers misapprehend the meaning of section 11162. It means precisely what it says and is not amenable to a construction that the Board's authority to provide for the application of its principles somehow hinges on the type of ICC proceeding involved.

Stated simply, the first sentence of section 11162(a) provides that once the Board identifies a cost that is directly or indirectly associated with particular movements of goods, the Board may establish principles for determining that cost. It cannot be asserted, and we do not understand challengers to have asserted, that the Board's principles on entity, cost of capital, asset valuation, and productivity

do not address costs associated with individual movements. Moving goods necessarily involves capital and asset costs. Further, if cost changes are to be measured accurately, there clearly is an element of productivity that must be factored into the adjustment index used by ICC to measure changes in costs associated with the movement of goods. Finally, in any conglomerate enterprise that moves goods, there is an entity that must be defined in order to arrive at the railroad-related activity for which cost determinations are relevant.

Having established principles for costs unquestionably associated with individual movements, the Board then looked to the Act for instruction about the scope of their application. Were the principles not applicable to all costs relevant to all ICC regulatory proceedings? The challengers infer from the first sentence of section 11162(a) that these principles are not applicable to all costs, namely to the aggregate costs determined by ICC in revenue adequacy and other proceedings. However, the second sentence of section 11162(a) is unequivocal:

"Such principles shall govern the determination of all railroad costs for specific regulatory proceedings under this title." (Emphasis added)

Had Congress intended to limit the Board's principles to the relatively innocuous purpose of determining individual costs in proceedings on individual movements, it would not have so explicitly directed the Board to do otherwise, nor would it have included the requirement in 49 U.S.C. § 11162(b)(1) that the Board take into account the "specific regulatory purposes for which railroad costs are required." Apparently, in challengers' view, the Board is not at liberty to consider which regulatory proceedings require the determination of accurate costs.

To summarize, the Board's exposure draft contains statements of principles on those costs which are directly and indirectly associated with specific movements of goods, as required by the first sentence of section 11162(a). Then, consistent with the last sentence of section 11162(a) and with section 11162(b)(1), the exposure draft provides for the application of principles to all types of costs relevant to the specific types of regulatory proceedings conducted by the ICC.

Even if the Act did not explicitly provide for the application of Board principles to all costs, which it does, it would not follow that the specific principles enunciated by the Board would not apply in the ICC proceedings that involve the determination of aggregate costs. Although the

proceedings at which these aggregate costs are determined do not address individual movements or the cost of such movements, we believe the aggregate costs determined in those proceedings are indirectly associated with individual movements. Thus, if one accepts, as we shall demonstrate, that aggregate costs are indirectly associated with individual movements, even challengers' misreading of the Act will not support their efforts to limit the application of the Board's principles, which, under the language of the Act, extend to those costs indirectly associated with the movement of goods.

The decisions made by the ICC in revenue adequacy, abandonment, competitive access and RCAF proceedings, which involve the determination of aggregate costs, have a significant bearing on individual movements of goods. Revenue adequacy affects the degree of flexibility a railroad may have to increase rates for particular movements of goods. Particular movements are affected by decisions in abandonment cases because the goods may have to be moved over a different railroad line. Of course, this will affect the costs of operation of the new carrier and ultimately the price the shipper will pay to have its goods moved. Particular movements also are affected by decisions in competitive access proceedings when, for example, one carrier incurs the cost of providing access and another carrier pays for the access received with a resulting adjustment to the rates paid by the shipper. Finally, the RCAF directly affects the increase in rates carriers may impose for individual movements.

However, under the regulatory standards presently used by the ICC, the calculation of the cost of a particular movement either is not used, or if used, does not control the outcome of these ICC regulatory proceedings. The decisions in these proceedings are made in varying degrees on the basis of aggregate costs of a railroad or a line it operates, with little or no regard for calculations of the cost of individual movements. That these proceedings affect movements of goods necessarily means that the cost determinations made incident to these proceedings are, in the words of the statute, costs which are at least indirectly associated with the particular movements affected. Not applying the principles to cost determinations made for revenue adequacy and other rate-making purposes would undermine the utility of determining costs directly associated with a particular movement of goods.

Adopting the position asserted by the challengers that the Board may not establish principles for application to proceedings which do not involve calculation of individual movement costs would effectively eviscerate the usefulness

of the Board's cost principles. This is because virtually all of the regulatory standards adopted by the ICC which ultimately affect rates for movements of goods involve the calculation of costs for more than an individual movement itself. The decisions made by the ICC in revenue adequacy, abandonment, competitive access, and RCAF proceedings are among the most critical ones affecting how goods are moved and the rates charged for such movements. Regulatory decisions affecting movements of goods made on the basis of direct movement costs are few indeed. If the application of the Board's principles were restricted to determining specific movement costs in proceedings on particular movements, the usefulness of the principles to regulatory decisions that ultimately affect such movements would be limited and insignificant. The logical extension of the specific challenges to the Board's principles is to delete from the exposure draft all discussion of their application to revenue adequacy, abandonment and other regulatory proceedings that involve cost determinations for other than specific movements. The challengers' position, if adopted, would create the anomaly of sound cost accounting principles not being applicable in the regulatory proceedings which ultimately have the greatest effect on individual movements of goods. Surely Congress did not create a special board to develop cost accounting principles with this result in mind.<sup>3/</sup>

It is clear that the Board's principles must apply to all costs in all regulatory proceedings if they are to contribute to ensuring that regulatory decisions affecting

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<sup>3/</sup> The Board's principles are consistent with the views expressed by sponsors of the 1984 reauthorization of the Board. (Regarding the importance of post-hoc expressions of legislative intent as a kind of expert opinion entitled to some persuasive value, see, e.g., Bell v. New Jersey & Pennsylvania, 461 U.S. 773 (1983); Seatrain Shipbuilding Corp. v. Shell Oil Co., 44 U.S. 572 (1980). Monongahela Power Co. v. Alexander, 507 F. Supp. 385 (D.D.C. 1980); United States v. Solvents Recovery Service of New England, 496 F. Supp. 127 (D. Conn. 1980)). The debate in the House contains specific references to the Board's principles being helpful in proceedings which have been explicitly or implicitly challenged as outside the Board's authority. These include revenue adequacy proceedings, stand-alone costs determinations, and return on investment calculations. Cong. Rec. H532 (daily ed. February 7, 1984) (statements of Representatives Lent, Rogers, and Rahall).

particular movements are based on accurate cost information. The principles proposed in the exposure draft reflect the Board's attention to the broad purposes of the Act. It is an established axiom that statutes should be interpreted so that their manifested purpose can be accomplished. In this regard, courts have liberally interpreted statutes granting powers to administrative agencies to effectuate the purposes and objectives of the statute. United States v. Zazove, 334 U.S. 602, 92 L.Ed. 1601, 68 S.Ct. 1284 (1948); Johnson v. Southern Pac. Co., 196 U.S. 1, 49 L.Ed. 363, 25 S.Ct. 158 (1904). The goals of the Act are embraced not only in the authority of the Board to establish principles for costs directly or indirectly associated with particular movements of goods, but also in the statutory mandate that such principles shall govern the determination of all railroad costs for specific regulatory proceedings. To require accurate movement costs without concern as to how other indirectly associated cost calculations relate to their ultimate effect on such movements would be to ignore the basic underlying purpose of the Board's responsibilities.

Relationship of the Proposed Principles and the Regulatory Policy and Rate-making Authority of the ICC

Challengers assert that the Board's mission to establish principles governing the determination of costs may be achieved without infringing on the ICC's authority to establish regulatory policy and set standards. I agree. However, there is necessarily some tension between the Board's authority to establish principles governing the determination of all costs in regulatory proceedings, and the ICC's authority to establish regulatory policy and set rate-making standards. That the Board's principles ultimately will affect the regulatory policies and rate-making decisions of the ICC is unmistakable. Indeed, one could not imagine that Congress intended otherwise. The real issue therefore is whether the Board's principles go beyond the objective of accurately determining costs and interfere with the conduct of regulatory policy so as to impermissibly intrude on the authority exclusively reserved to the ICC.

The challengers assert that the treatment of some costs contained in ICC standards poses regulatory policy issues and that the Board assumes the regulatory role of the ICC when it establishes principles on how those costs should be determined in regulatory proceedings. They state that cost elements contained in a regulatory standard are outside the Board's jurisdiction if the purpose of the proceeding in which the standard is used is to constrain rates and not to

determine the cost of a particular movement.<sup>4/</sup> Therefore, challengers argue that the Board only may prescribe alternative principles for some costs. For example, they suggest the Board could establish one principle for valuing assets on a predecessor cost basis and another principle for valuing assets on an acquisition cost basis, and then leave to the ICC the decision on the relevant cost for regulatory treatment.<sup>5/</sup>

These assertions misconstrue the Board's statutory function. All regulatory standards, as well as all the principles and the costs determined pursuant to them, ultimately influence rates. It therefore strains credulity to contend that the Board impermissibly assumes the regulatory functions of the ICC simply because its cost principles apply to regulatory standards whose primary purpose is to affect rates. Further, the "alternative" approach suggested by the challengers would directly contradict the requirement in 49 U.S.C. § 11162(a) that the Board establish principles to determine economically accurate costs. When the Board determines that one method of accounting better represents the economically accurate cost of the assets used in rail transportation, section 11162(a) authorizes the Board to establish a principle for the better method. In so doing the Board assumes the specific role Congress entrusted to it.

The Board has consistently recognized that the ICC and not the Board is responsible for establishing regulatory policy and standards for rate-making. The Board stated in its January 31, 1986, discussion memorandum that it:

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<sup>4/</sup> Challenges to the Board's authority on the basis that revenue adequacy is a constraint on rates and not designed to determine costs of individual movements implicitly encompass other regulatory standards in which challengers have stated their agreement with the Board, such as stand-alone cost. Like revenue adequacy, stand-alone cost acts as a constraint on rates and does not represent the actual cost of individual movements.

<sup>5/</sup> The revenue adequacy determination also involves the cost of capital. Challengers arguing that the Board lacks authority to establish principles for the proper method of valuing assets have commented that the Board properly determined the cost of capital for use in revenue adequacy proceedings. The challenge to the asset valuation principle must apply to the cost of capital principle as well.

"\* \* \* will be concerned only with establishing accounting principles to govern cost applications by the ICC and not with rate-making or other policy determinations within the domain of the ICC's regulatory functions."

More specifically, with regard to maximum rates, the General Counsel advised the Board in a memorandum dated March 12, 1986, of the distinction between the ICC establishing regulatory standards and the Board addressing cost determinations:

"It is the ICC's responsibility to decide on the appropriate regulatory standard for maximum rates. The ICC, and not the RAPB, has the statutory authority for issuing regulatory standards for rate-making. It only is because the ICC has chosen a cost standard, albeit hypothetical, to determine maximum rates that the RAPB may establish principles on [stand-alone costs]. If the ICC continues to use the 'costs of serving the shipper alone' as its regulatory standard, they would have to be based on the RAPB's principles to the extent applicable."

And, with regard to competitive access, the Board explicitly stated in the exposure draft that its:

"\* \* \* consideration in competitive access is limited to costs. The RAPB does not address rate-setting. In establishing competitive access compensation levels, the ICC is likely to use factors in addition to cost."

The Board has remained true to the division of authority described above. The Board has not questioned whether revenue adequacy is accurately measured by comparing return on assets to cost of capital; nor has it addressed the appropriate compensation to be provided in competitive access proceedings or whether stand-alone costs is a proper regulatory standard for determining reasonable maximum rates. Rather, the Board has accepted the regulatory standards established by the ICC and limited itself to the cost elements contained in those standards.

#### Benefits and Costs of Complying with the Principles

In developing cost accounting principles, the Board is required to consider the capability of carriers to provide cost information and the relative benefits and costs of

requiring development of the capability needed to provide such information. 49 U.S.C. § 11162(b)(3).

The Board has proposed a practicality principle that addresses the thrust of section 11162(b)(3). The statement of principle provides, in pertinent part, that information must generate benefits that exceed the costs of providing it. The explanation section of the principle explains that the principle provides flexibility in applying the other principles so that less expensive methods of determining costs may be used if significant differences do not result. The application section provides examples of how the other proposed principles may be applied in regulatory proceedings so as to minimize costs. For example, the entity principle requires segregation and separate reporting of railroad-related activities and nonrailroad-related activities when certain conditions exist. But the practicality principle provides alternatives when segregation is impractical.

In addition to the flexibility provided by the practicality principle, that the Board considered costs in developing its principles also is reflected by alternative requirements suggested to, but not adopted by, the Board in its other principles. For example, the exposure draft's discussion of the data integrity principle specifically states that the Board did not adopt a requirement for independent auditors to provide positive assurances for information submitted to the ICC because of the expense of compliance. Similarly, the discussion of the entity principle states that while costs of reporting appear moderately higher, greater economic accuracy will be achieved.

Challengers assert that before establishing its principles, the Board is required to conduct a rigorous cost-benefit analysis. This assertion suggests section 11162(b)(3) reflects the Congress' expectation that the benefits and costs of the principles can be measured in concrete terms by what the challengers call, but do not define, a rigorous cost-benefit analysis.

The legislative history of the Act suggests a different standard. The Conference Report on the Act states that the principles "are to emphasize the degree of economic accuracy needed for regulatory purposes and not merely the accumulation of more detailed, but not necessarily more accurate, accounting information." H.R. Rep. No. 1430, 96th Cong., 2d Sess. 123 (1980).

There is no evidence to suggest that Congress intended section 11162(b)(3) to require the Board to quantify the benefits and costs of the principles. Rather, section

11162(b)(3) is an admonishment that the Board not, in the words of Representative Madigan, "require railroads to produce all kinds of facts and figures for the gratification of Government bureaucrats." 126 Cong. Rec. 17790 (June 30, 1980). The Board has taken these words to heart and proposes principles which it concludes will result in more accurate determinations of cost that are justified by the expense of compliance.

#### CONCLUSION

After considering the various challenges to the Board's authority to establish the principles proposed in the exposure draft, I conclude that the principles are within the authority provided the Board in 49 U.S.C. § 11162. The Board has proposed principles consistent with the broad purposes of the Staggers Rail Act of 1980 without impermissibly infringing on the regulatory policy and rate-making authority of the ICC. The Board also has considered the costs and benefits of its principles consistent with the requirements of the Act.

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July 8, 1987

Hon. Charles A. Bowsher  
Chairman  
Railroad Accounting Principles Board  
441 G Street, N.W.  
Washington, D.C. 20548

Dear Mr. Bowsher:

This letter responds to your request that we offer an independent opinion as to the scope of the Railroad Accounting Principles Board's statutory mandate. Certain of the Board's actions have been challenged as exceeding the authority granted to it by Congress, and you have asked us for our opinion as to whether the challenges have merit. In conducting our review, we have consulted relevant legislative materials, consisting of committee reports, hearings, and floor debates in the House and Senate, as well as a draft opinion of the Board's General Counsel addressing this issue. We have also been given copies of prepared and transcribed remarks before the Board setting forth the challenges you have asked us to consider. As described more fully below, and without expressing a view as to the merits of the Board's specific proposals, we have concluded that the Board has acted within the scope of its authority.

Briefly, the Board's stated function is to "establish . . . principles governing the determination of economically accurate railroad costs directly and indirectly associated with particular movements of goods." 49 U.S.C. § 11162(a). This function is integrally linked to the Staggers Rail Act of 1980, Pub. L. 96-448, 94 Stat. 1895 (1980), which recognizes particular railroad costs as touchstones for rail regulation. On February 20, 1987, the Board set forth a preliminary statement of views in an exposure draft issued for public comment. The exposure draft proposes eight cost accounting principles<sup>\*/</sup> and explains how some or all of

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<sup>\*/</sup> Four of the principles are termed general, and reflect basic concepts of sound cost accounting practice: causality, homogeneity, practicality, and data integrity. The remaining four principles are termed specific, and relate to particular inquires made by the ICC in a variety of contexts: definition of entity, cost of capital, asset valuation and related expense, and productivity.

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them would apply to the following specific regulatory determinations made by the ICC:

- (1) revenue adequacy;
- (2) competitive access;
- (3) abandonment;
- (4) rail cost adjustment factor ("RCAF");
- (5) maximum rate;
- (6) minimum rate/evaluation of "Long-Cannon" factors; and
- (7) surcharges.

The Board's determination that its cost accounting principles would apply to items (1) through (4) above is the subject of the jurisdictional challenge at issue here. The challengers assert that ICC determinations of revenue adequacy, competitive access, abandonment, and RCAF do not relate to costs associated with "particular movements of goods," and thus any effort by the Board to apply cost accounting principles to them would exceed its statutory mandate. The challengers characterize these ICC determinations as involving not the costs of particular movements, but aggregate cost determinations relating to a railroad's operation as a whole, or to all operations over a particular portion of track, or even to the operations of all railroads as a group.

We believe that the narrow interpretation proposed by the challengers is not supported by the statutory language, legislative history, or relevant policy considerations. Rather, we conclude that the Board's broader interpretation of its mandate, essentially to include all railroad cost determinations relevant for regulatory purposes, more accurately reflects congressional intent as we have been able to discern it.

With respect to the statutory language, the question is what Congress intended when it authorized the Board to act with respect to costs "directly and indirectly associated with particular movements of goods." The keystone of the challengers' argument is that only particular movements of goods are within the Board's jurisdiction, with use of the term "indirectly" apparently meaning only that the Board is

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authorized to consider elements of cost, such as overhead or depreciation, that cannot be "directly" attributed to particular movements. A broader interpretation of this language is adopted by the Board. By way of example, under the broader interpretation the costs of an entire operation of a railroad are costs "indirectly" associated with "particular movements of goods" because the total merely represents the sum of the costs of all the particular movements.

Both interpretations of the particular statutory phrase are plausible. Other portions of the statute suggest, however, that the broader interpretation is what Congress intended. The Staggers Act establishes a national railroad policy "to ensure the availability of accurate cost information in regulatory proceedings." 49 U.S.C. § 10101a(14). Similarly, the Board is itself required in developing cost principles to take into consideration, among other things, the "specific regulatory purposes for which railroad costs are required" and the "degree of accuracy of the cost information which is needed to meet regulatory purposes." *Id.* § 11162(b)(1) and (2). Once issued, the principles are to be implemented by the ICC through a rulemaking proceeding, and thereafter "shall govern the determination of all railroad costs for specific regulatory proceedings" conducted by the ICC under the Staggers Act and prior legislation. *Id.* § 11162(a). Moreover, the Staggers Act gives specific authority to the ICC to establish rules for the submission of expense and revenue information by railroads. That general authority however, is circumscribed by the Board's role: "To the extent such rules are required solely to provide expense and revenue information necessary for determining railroad costs in regulatory proceedings pursuant to [Title 49 of the U.S. Code], such rules shall be promulgated in accordance with the cost accounting principles established by the Railroad Accounting Principles Board . . . ." These references suggest a general concern with the accuracy and reliability of all railroad cost data used by the ICC. They offer no support for an interpretation in which the quality of only some cost data is important.

Relevant legislative materials also make clear that Congress did not intend that the Board be forbidden from addressing broader railroad cost determinations. The principal focus of the Board's work may well be the narrow question of the costs of particular movements in order to assess the reasonableness of rates for such movements. It is clear, however, that this is not the Board's exclusive focus. In the legislative history of the Staggers Act there is express reference to the Board's work producing cost data "necessary for regulatory purposes," specifically including abandonments and railroad mergers. 126 Cong. Rec. H5906 (daily ed. June

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30, 1980) (statement of Rep. Madigan). Both abandonments and mergers involve cost determinations much broader than those the Board would be permitted to consider under the challengers' interpretation.

Additional support for the broad view also exists in the legislative history attendant to the Board's reauthorization in 1984.<sup>\*/</sup> Specific reference is made in the floor debate to the applicability of the Board's work to revenue adequacy and return on investment determinations by the ICC. See 130 Cong. Rec. H532 (daily ed. February 7, 1984), (remarks of Reps. Florio and Rogers). These references belie the limitations on the Board's role that the challengers propose.

We have located no specific reference in the legislative history to the anticipated applicability of the Board's principles to RCAF determinations, but do not consider this absence to indicate an intent to exclude that challenged function from the Board's jurisdiction. The RCAF is applied to rates for particular movements and is intended to represent changes in railroad costs attributable to inflation. As such, the factor seems well within the Board's statutory mandate. Equally important, we can think of no rationale expressed in the legislative history pursuant to which RCAF could be distinguished from other regulatory determinations clearly intended to be within the scope of the Board's jurisdiction. The same reasoning applies to competitive access determinations, which Congressman Florio also expressly indicated during oversight hearings on the Staggers Act would be within the scope of the Board's effort. See Staggers Rail Act: Oversight (Part 2): Hearings Before the Subcomm. on Commerce, Transportation, and Tourism of the House Comm. on Energy and Commerce, 98th Cong., 1st Sess. 202-203 (1983) (remarks of Rep. Florio).

Finally, the Board's broad interpretation of its mandate appears consistent with applicable policy concerns.

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<sup>\*/</sup> The Board was reauthorized by the House upon passage of H.R. 4439 on February 7, 1984. The Legislative Branch Appropriations Act of 1985, P.L. 98-367, 98 Stat. 472, appropriated funds for the Board "to be expended in accordance with the provisions of H.R. 4439." 98 Stat. 488.

The challengers have suggested that this legislative history should be ignored because it merely represents the funding of an authorization made in 1980. See, e.g., Tennessee Valley Authority v. Hill, 437 U.S. 153, 190 (1978). The 1984 action was itself a reauthorization, however, and is thus entitled to be given full weight. See also Bell v. New Jersey, 461 U.S. 773, 784-85 (1983).

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The effective operation of the Staggers Act depends upon use of "economically accurate" costs, and it is the Board's mission to enable such costs to be developed. This statutory relationship would be undercut if the Board were prohibited from addressing the full range of cost data required for regulatory purposes. It would be illogical, for example, for the Staggers Act to require the use of economically accurate costs in setting maximum base rates but permit that rate to be adjusted by an inaccurate RCAF multiplier to compensate for inflation.

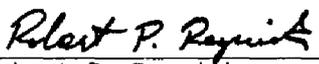
In reaching our conclusion that the Board's broader interpretation of its statutory mandate is consistent with pertinent statutory provisions, legislative history, and policy concerns, we have also considered the draft opinion by the Board's General Counsel. We endorse that opinion and agree with its conclusions. Further, we express agreement with the reasoning and determination of the General Counsel in rejecting two subsidiary arguments advanced by the challengers. We concur with the General Counsel that the Board has not (1) impermissibly taken upon itself a policymaking role, or (2) ignored the requirement of 49 U.S.C. § 11162(b)(3) that the Board consider the relative costs and benefits of requiring cost information to be produced by railroads.

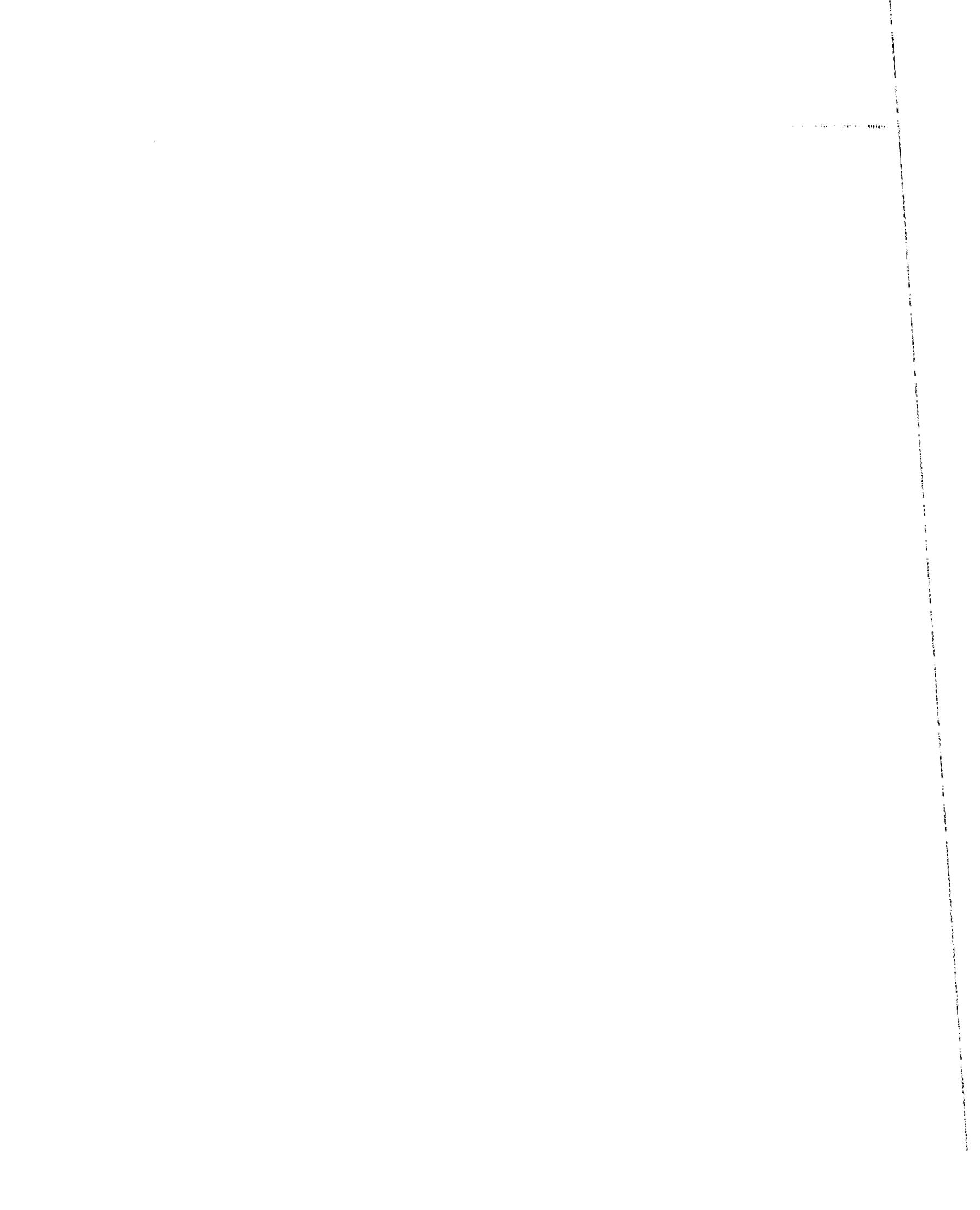
We are gratified that you have turned to us for an opinion on this important matter, and we will be available for any discussion or any questions you may have.

CLIFFORD & WARNKE

BY:

  
Clark M. Clifford

  
Robert P. Reznick



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