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Confusion in Valuation for Public Utility Rate-Making

There are two steps in the rate-making process for public utilities—valuation of the public utility property in order to ascertain a rate base and determination of a proper rate of return. This Article concerns the first step. Professor Rose analyzes the various concepts of "value" as used by the states. He concludes that diversity and confusion in valuation have resulted from a failure to define "value" in operational terms, but that the confusion can be removed by adopting uniform legislation prescribing original cost as the rate base.

Joseph R. Rose*

The present study is designed to fill a gap in the literature on public utility rate-making in the states by presenting a comprehensive review and classification of the current statutes, commission interpretations, and judicial decisions on valuation for rate-making purposes. The purpose of this review is not merely to offer a single source for reference and comparison, but to look into the fundamental meanings that have been associated with the concept of "value" in the rate-making process and to examine the concept independently in terms of the only criterion relevant to it, the welfare of society.

Valuation of public utility property for rate-making may be said to have begun in 1898 with the decision of the Supreme Court of the United States in Smyth v. Ames. In that case the Court declared a constitutional requirement that rates must be calculated to yield a fair return on the "fair value" of utility property.

* Chairman of the Department of Transportation and Public Utilities, Wharton School of Finance and Commerce, University of Pennsylvania. The author gratefully acknowledges the exceptionally important contributions to this article by Mr. Amor Gosfield, formerly of the Department of Economics of the University of Pennsylvania. Not only did Mr. Gosfield edit the entire manuscript with exceptional care, but he also made basic additions to the economic analysis in Part III.

1. 169 U.S. 466 (1898).
2. The Court defined fair value as a judgment figure to be derived by the regulatory authority after giving consideration to, inter alia, original cost of construction, amount and market value of bonds and stock, and the earn-
Fair value thus became the "law of the land," and regulatory authorities, with a few notable dissidents, adopted it as the rate base. In 1944, however, the Court in *FPC v. Hope Natural Gas Co.* removed fair value, and indeed valuation, as a constitutional requirement. Prior to *Hope* valuation for rate-making was substantially uniform throughout the country, at least in principle, despite incessant and unremitting opposition to fair value as the rate base by advocates of original cost. After *Hope* regulatory agencies proceeded to re-examine law and policy in the light of past experience and contemporary conditions. Consequently, uniformity in valuation has been succeeded by the application of a variety of valuation methods to rate-making, although fair value has demonstrated remarkable vitality. At this date three principles of rate-base determination prevail: fair value, original cost, and reproduction cost. Fair value in some form governs valuation

This concept of fair value was soon modified. In 1909 the Supreme Court held in *City of Knoxville v. Knoxville Water Co.*, 212 U.S. 1 (1909), that accrued depreciation must be deducted from original and reproduction cost in establishing fair value. In addition it was early realized that market value of securities and earnings could not properly serve as the basis of determining earnings. The Minnesota Rate Cases, 230 U.S. 352, 461 (1913). Consequently, "fair value" has been often re-interpreted as a judgment figure predicated principally upon original and reproduction costs, both depreciated. But the original version of fair value as defined in *Smyth v. Ames* still persists in some jurisdictions, as shown below.

4. 320 U.S. 591 (1944). The Court in abandoning the rule of *Smyth v. Ames* declared: "Rates which enable the company to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risks assumed certainly cannot be condemned as invalid, even though they might produce only a meager return on the so-called 'fair value' rate base." *Id.* at 605.

5. There are several versions of original cost. It ordinarily means the actual money cost of property at the time when it was first dedicated to the public use, whether by the present company or its predecessors. 47 C.F.R. § 31.01-3(x) (1958). See also American Tel. & Tel. Co. v. United States, 299 U.S. 232 (1936). "Prudent investment" resembles cost when first devoted to public use but, as explained by Mr. Justice Brandeis in his separate opinion in *Missouri ex rel. Southwestern Bell Tel. Co. v. Public Serv. Comm'n*, 262 U.S. 276, 289 (1923), the investment must have been made "prudently." See also *Los Angeles Gas & Elec. Co. v. Railroad Comm'n*, 289 U.S. 287 (1933). "Historical cost" is an estimate of prudent investment when accounting records do not show original cost. *Missouri ex rel. Southwestern Bell Tel. Co. v. Public Serv. Comm'n*, supra. Cost to the utility (other than cost when first devoted to public use) is the purchase price paid by the accounting utility for a plant already constructed. It is usually more than cost when first devoted, but may be less when the economic value of the property is impaired. *Market St. Ry. v. Railroad Comm'n*, 324 U.S. 548 (1945). "Book cost" denotes the amount invested in capital as stated in the accounting records. It may be equal to, greater, or less than original cost as above defined. In this discussion all these concepts of original cost are treated as equivalents unless a distinction is in controversy.
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in the rate-making of 17 states, original cost in some form in 30 states and the District of Columbia, and reproduction cost in

At least two versions of reproduction cost are now in vogue. Both seek to estimate the cost of reproducing the existing plant in service at current prices of material and labor. The traditional concept of reproduction cost assumes that the existing property is reconstructed as a whole in a single continuous operation. An engineering inventory is made, a period of construction is estimated, and current prices are applied to the units of property. These may be “spot” prices as of a given date or average prices for one, two, three, or five years. Wage rates and labor performance are also estimated. Pittsburgh v. Public Util. Comm'n, 169 Pa. Super. 400, 82 A.2d 515 (1951). Since World War II trended original cost has largely replaced estimates of reproduction cost. The practice first developed in the application of price indices to an estimate of a reproduction cost already in existence in order to avoid the expense of making another such estimate. Scranton-Spring Brook Water Serv. Co. v. Public Serv. Comm'n, 119 Pa. Super. 117, 146 (1935). Trending has now been extended to original cost by constructing index numbers for labor and materials and applying them to the original cost of the property as reflected in the primary accounts. The trending is brought down to the cut-off date of the rate proceedings. Bell Tel. Co., 16 P.U.R.3d 207 (Pa. Pub. Util. Comm'n 1956).

There are important differences between a traditional estimate of reproduction cost and trended original cost. One is that the former assumes that the property is reconstructed in a single operation and takes account of the economies of scale, whereas the latter does not give consideration to such economies because it is predicated on piecemeal construction. In the ensuing text both methods are usually referred to as reproduction cost.

While it is true that differences in computing the rate base may be neutralized by variations in the rates of return, the principal objectives of this article are to demonstrate the unsoundness of the “value” concept and to present a better approach to the valuation problem. Generally, differences in the rate base are not fully compensated by variations in the rate of return. See Returns Allowed on Fair Value Lower Than on Original Cost, 70 PUB. UTIL. FORT. 290 (1962). For a discussion of the problems of rates of return, see generally Freeman, An “Enlightened Judgment” Approach to Rate of Return, 61 HARV. L. REV. 1380 (1948).

6. Alabama Iowa Missouri New Mexico Arizona Kentucky Montana North Carolina Delaware Maryland Nebraska Pennsylvania Illinois Minnesota New Jersey Texas Indiana

Perhaps New York should be added since its law requires fair value for telephone rates. See notes 38–39 infra and accompanying text. It is classified below as an original cost jurisdiction because rates of all other utilities are based on original cost. The difficulties inherent in classification are apparent from the discussion of the law and practice in each of the states.


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only one state, Ohio.  
Within this division, however, the variety of statutory enact-
ments is extensive, and there is an even greater variation in appli-
cation and judicial construction. After Hope many new statutes
were passed and old ones were often re-interpreted. Most frequently
these changes specify "value" as the basis of valuation; less often
"fair value" or "reasonable value"; and occasionally original cost or
one of its variants. Sometimes these terms are explicitly defined
in the acts, but often they are not. Some statutes that provide for
valuation fail to link it with rate-making; others expressly relate
them. Many statutes make no mention of valuation at all. Fi-
nally a number defy classification.

Judicial construction of similar legislation is markedly conflict-
ing. At one extreme courts attribute to value, however qualified,
the traditional meaning of fair value as defined in Smyth v. Ames;
other courts hold that value signifies original cost. Commissions
are more consistent and usually interpret legislation, regardless
of terminology, to permit original cost to be used as the rate base
unless enjoined by the courts of their jurisdictions to use some
version of value or fair value.

The purpose of valuation is the same in all jurisdictions—to es-
tablish the base to which the allowable rate of return is applied in
order to ascertain the allowable return. The allowable return, of
course, is the cost of capital. In economic principle there can be
no justification for regionally diverse valuation principles, especial-
ly in view of the fact that public utilities, wherever situated, seek
capital in the same money markets of the nation. Since diversity
in the concept of valuation can serve no useful end, it follows that
the multifarious legislation and interpretations are evidence of con-
fusion and not of valid differences of circumstance or purpose.

The provenance of the confusion is in the concept of "value" it-

Alaska and South Carolina are not classified. The Alaska Public Service
Commission Act of 1959, ALASKA COMP. LAWS ANN. § 49–8 (1959), creat-
ed a commission but no cases have been reported in Public Utilities Reports.
Similarly, no South Carolina proceedings involving valuation were reported
in these reports for the period under survey. The South Carolina act regu-
larizing electric utilities empowers the Commission to fix just and reasonable
rates and to "fix the value of the . . . property of any public utility." 
has similar provisions. S.C. Code § 58–423 (1952). The law relating to
other utilities authorizes the Commission to prescribe reasonable rates but

8. City of Cleveland v. Public Util. Comm’n, 164 Ohio St. 442, 132
N.E.2d 216 (1956); City of Columbus v. Public Util. Comm’n, 154 Ohio
St. 107, 93 N.E.2d 693 (1950); East Ohio Gas Co. v. Public Util. Comm’n,
133 Ohio St. 212, 12 N.E.2d 765 (1938); OHIO REV. CODE § 4909.05
(Anderson 1953).
self. This protean term has had perhaps more meanings attributed to it than any other word in the language. A review of state and federal law governing valuation reveals (1) almost endless diversity in the statutory meanings and provisions ascribed to "value"; (2) the non-operational character of the concept of "value" as defined in rate-making; and (3) a failure to distinguish between "value" and "cost" as these terms are used in economic analysis.

I. DIVERSITY IN LEGISLATION AND INTERPRETATION

Six categories may be distinguished among the statutory enactments of the states relating to valuation and rates. Four expressly include "value" as the basis of valuation, but differ among themselves in that "value" is either (1) defined and associated with rates,9 (2) undefined but associated with rates, (3) defined but unassociated with rates, or (4) undefined and unassociated with rates. A fifth category associates original cost with rates, and the sixth merely provides that rates shall be reasonable without mention of valuation.

A. VALUE DEFINED AND ASSOCIATED WITH RATES

The most unequivocal provisions explicitly associating value and rate-making appear in the legislative enactments of Alabama, North Carolina, Kentucky, New Mexico, and Minnesota. The Alabama statute states that rates shall yield a fair return on "reasonable value"; those of North Carolina,11 Kentucky,12 and New Mexico13 specify a fair return on "value"; the Minnesota act, making no mention of either term, directs the Commission to consider original cost and "current value" in determining the rate base.14 "Fair value" and "value" in all of these statutes (except that of Minnesota) are defined as requiring consideration of origi-
nal cost and reproduction cost and therefore are the equivalent of the traditional concept of "fair value."

In Alabama and North Carolina the commissions construed the acts as permitting the use of original cost as the rate base, but were reversed by their supreme courts, which held that reproduction cost must also be given consideration. On remand the Alabama Commission found "reasonable value" by attributing two-thirds weight to original cost and one-third to reproduction cost. The policy of the North Carolina Commission in computing "value" varies, but it seems to include original cost as the principal component. In Kentucky the Commission determined the rate base primarily as original cost, and the highest court of the state affirmed by declaring that the rate of return applied by the Commission to original cost had been calculated to yield an adequate total return, and that if a higher rate base had been adopted by consideration of reproduction cost, a lower rate of return would have been justified. It indicated that it would not disturb rates designed to produce adequate earnings even when reproduction cost was not given "due consideration." The policy of the Kentucky Commission on valuation varies so much as not to be subject to generalization. In New Mexico the act has not been interpreted

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by the state supreme court. The Commission in recent proceedings has proclaimed its adherence to fair value, but it has used original cost as the basic element and added to it an increment to compensate for higher present cost.\textsuperscript{20} Valuation under the Minnesota law has not been in controversy before the Minnesota Supreme Court; the Commission has held that "current value" as set forth in the statute denotes reproduction cost and that fair value is the measure of the rate base.\textsuperscript{21} It has given equal weight to original cost and reproduction cost in finding fair value.\textsuperscript{22}


In Walter S. Ray, 17 P.U.R.3d 413 (N.M. Pub. Serv. Comm'n 1957), the Commission accepted original cost as the rate base but compensated for present cost in fixing the rate of return. In Southwestern Pub. Serv. Co., 15 P.U.R.3d 357 (N.M. Pub. Serv. Comm'n 1956), the Commission adopted original cost in similar circumstances, declaring that the "rate base was computed in accordance with the practice which the commission customarily has employed . . . ."\textsuperscript{id} at 360. In Southern Union Gas Co., 36 P.U.R.3d 60 (N.M. Pub. Serv. Comm'n 1960), however, the Commission used conventional fair value, giving somewhat greater weight to reproduction than to original cost.


B. VALUE UNDEFINED AND ASSOCIATED WITH RATES

Legislation in eight states—Texas, Maryland, Washington, Michigan, Mississippi, Kansas, New York, and Wyoming—expressly includes "value" as the rate base and links it to rate making, but does not define it. The statutes of the first four states specify "fair value," those of Mississippi and Kansas "reasonable value," and those of New York and Wyoming "value."

The commissions in Texas and Maryland found "value" by taking original cost as the basic factor and adding an increment to it, apparently to compensate for reproduction cost, instead of giving consideration to reproduction cost as such. The Texas Supreme Court reversed such a finding, declaring that fair value should be determined "as a reasonable balance" between original cost and reproduction cost, while the Maryland Supreme Court affirmed its Commission's finding. The Washington and Mich-
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Igan commissions employ original cost as the rate base, but the issue has not been before their courts in recent years.

The commissions of both Mississippi and Kansas construed "reasonable value" as permitting use of original cost. The Mississippi Supreme Court approved this interpretation of the law,\(^36\) while in Kansas there has been no recent pronouncement on the issue by an appellate court.\(^37\)

In New York the Commission adopted original cost as the measure of "value," but was reversed by the New York Court of Appeals, which held that "value" differs from cost and that the act obligated the Commission "to receive proof of reproduction cost less depreciation as some evidence of present value ... ."\(^38\) Upon remand the Commission admitted evidence of reproduction cost and declared that the evidence demonstrated marked inflation in construction and labor costs so that replacement of the company's plant would cost more than when it was built. It concluded, however, that from the evidence it could not ascertain with


exactness what replacement cost would be, and therefore it used original cost as the rate base, making adjustment for inflation in the rate of return. The Wyoming Supreme Court construed the act as binding the Commission to no particular formula in selecting a rate base, and the Commission uses original cost.

C. VALUE DEFINED BUT UNASSOCIATED WITH RATES

Statutes in five jurisdictions—Delaware, Indiana, Georgia, and Nebraska—provide for “fair value” or “value” as the basis of valuation and define the terms, but do not relate rates to valuation. The Delaware and Indiana acts specify “fair value,” while Georgia’s act empowers the Commission to ascertain the “cost of construction” and the “present value” of utility property. The District statute directs the Commission to ascertain and consider the amount of money expended for construction and the “replacement value” of public utility facilities. The Nebraska law makes it the “duty of the . . . Commission to ascertain . . . the physical value of each . . . public service corporation in this state . . . .” and appears to define such value as reproduction cost.


South Dakota may also be included in the category of states that associate value with rate-making, although the statute makes no mention of value. It simply authorizes the Commission “to make a physical valuation of all the property of any telegraph or telephone company . . . when such valuation is necessary for the purpose of arriving at any determination in connection with the regulation of its business or the adjustment of its rates.” S.D. Code § 52.0269 (1939). The South Dakota Supreme Court appears to have construed the act to permit use of original cost as the rate base. See Application of Northwestern Bell Tel. Co., 78 S.D. 15, 98 N.W.2d 170 (1959). The Commission employs original cost. Northwestern Bell Tel. Co., 36 P.U.R.3d 67 (S.D. Pub. Util. Comm’n 1960).

42. DEL. CODE ANN. tit. 26, § 126 (1953).
43. IND. ANN. STAT. § 54–203 (1951).
44. GA. CODE ANN. § 93–308 (1958).
The Delaware law states that the Commission in determining fair value may take account of original cost and reproduction cost. When the Delaware Commission ascertained fair value without revealing the precise manner in which it arrived at its finding, the Delaware Supreme Court reversed, holding that the Commission must demonstrate consideration of both original cost and reproduction cost. In subsequent proceedings the Commission fixed fair value at the approximate average of these two factors. The Indiana act requires the Commission to consider original cost in determining fair value while providing that it may consider reproduction cost. At first the Commission did not consistently adhere to fair value, but more recently the Indiana Supreme Court declared that fair value is the rate base under the law, and the Commission now gives weight to both original cost and reproduction cost. It is impossible, however, to discover from the Commission's findings of fair value any consistency in the relative weights it attributes to each of these factors.

The valuation issue has not been before the Georgia courts recently, and the Commission employs original cost without deviation. The District statute was interpreted by the United States

50. Public Serv. Comm'n v. Indiana Bell Tel. Co., 235 Ind. 1, 15, 130 N.E.2d 467, 473 (1955). See also Public Serv. Comm'n v. City of Indianapolis, 235 Ind. 70, 95, 131 N.E.2d 308, 318 (1956). In an earlier proceeding the Indiana Supreme Court had said that "the statute is broad enough to permit the commission... to utilize... the reproduction costs at current prices... in order to determine present fair value." Public Serv. Comm'n v. Indianapolis Ry., 225 Ind. 656, 662, 76 N.E.2d 841, 843-44 (1948). (Emphasis added.)
Court of Appeals for the District Circuit as not compelling the use of any particular method of valuation, and the Commission employs original cost. The Nebraska act has not been construed by the courts; the Commission sometimes adopts original cost as the rate base, and at other times it takes account of reproduction cost.

D. Value Undefined and Unassociated with Rates

The most common regulatory provisions, found in 15 states, include "fair value" or "value" as the basis of valuation, but neither define these terms nor associate them with rate making. Statutes in Massachusetts and Pennsylvania and the Arizona


56. The Nebraska Supreme Court has declared in dicta that "reasonable value" is the rate base without defining it. Oakdale Tel. Co. v. Wilgocki, 171 Neb. 425, 106 N.W.2d 486 (1960); Skeehee Independent Tel. Co. v. Farm Bureau, 166 Neb. 49, 87 N.W.2d 715, 719 (1958).


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specify "fair value," while provisions in Illinois,
Montana, New Jersey, California, Wisconsin, Utah, Arkansas, Idaho, Colorado, Oklahoma, Nevada, and Oregon mention "value."

In Massachusetts the Commission's traditional policy of using original cost as the rate base has recently received the approval of the Supreme Judicial Court. On the other hand, an attempt by the Pennsylvania Commission to adopt original cost was thwarted by the Pennsylvania Superior Court, which required traditional fair value, and fair value is deeply imbedded in Pennsylvania practice. The relative weight given by the Pennsylvania


Commission to original cost and reproduction cost varies.\textsuperscript{77} In Arizona when the Commission computed the rate base on original cost plus an increment ostensibly calculated to reflect the influence of reproduction cost, the Arizona Supreme Court affirmed the Commission’s order, but declared that reproduction cost as such must be considered in a finding of fair value as well as original cost.\textsuperscript{78} The Commission, following the court’s mandate, attributes equal weight to each of these elements.\textsuperscript{79}

The supreme courts of Illinois, Montana, and New Jersey construe value as signifying “fair value.” The first two attribute to “value” the traditional meaning of fair value, while the third permits a modified version of it. The Illinois\textsuperscript{80} and Montana\textsuperscript{81} commissions both adopted original cost under the acts but were re-

\textsuperscript{77} In Scranton Steam Heat Co. v. Public Util. Comm’n, 194 Pa. Super. 143, 152, 167 A.2d 693, 698 (1960), the court said: “[T]he commission has been inclined to establish fair value at a point near the average of original cost depreciated and reproduction cost depreciated.” In fact, the Commission’s practice is not consistent. The Commission not only accepts original cost in evidence, but also accepts various estimates of trended original cost based on spot prices, three-year average prices, and five-year average prices. It often fails to make a specific finding of reproduction cost, merely asserting that it gives consideration to all the evidence. For example, in Borough of Pen Argyl v. Blue Mountain Consol. Water Co., 36 P.U.R.3d 72 (1960), the Commission found deficiencies in the estimates of reproduction cost, but made no finding of it. It determined fair value at a sum close to original cost, but at the same time gave substantial weight to the estimates of reproduction cost. In Philadelphia Transp. Co., 36 P.U.R.3d 113 (Pa. Pub. Util. Comm’n 1960), the Commission made findings of reproduction cost at spot prices and at three-year average prices as well as original cost. Again it expressed some dissatisfaction with the estimates of reproduction cost and used original cost as the principal factor. In Riverton Consol. Water Co. v. Public Util. Comm’n, 186 Pa. Super. 1, 140 A.2d 114 (1958), the Commission made findings of original cost, reproduction cost at spot prices, reproduction cost on three-year average prices, and reproduction cost on five-year average prices. The finding of fair value approximated the average of original cost and the estimate of reproduction cost at three-year average prices, which was the median estimate of reproduction cost.

\textsuperscript{78} The court said that the Commission is entitled to determine the “probative force” of estimates of reproduction cost and that “no set, rigid formula is required to be used,” but if supported by “legitimate evidence,” reproduction cost “must be allowed to influence the rate base in some degree.” Simms v. Round Valley Light & Power Co., 80 Ariz. 145, 153-54, 294 P.2d 378, 383-84 (1956). See also Arizona Corp. Comm’n v. Arizona Water Co., 85 Ariz. 198, 335 P.2d 412 (1959).


versed by their courts. The Illinois Commission now gives threequarters weight to original cost and one-quarter to reproduction cost in finding "value," and the state supreme court has affirmed this practice. The Montana Commission has admittedly followed an inconsistent policy in respect of weighting the two elements. In New Jersey the Commission gives consideration to reproduction cost, but generally finds that it is entitled to little credence and either accepts original cost as the measure of "value" or adds an insignificant sum to reflect reproduction cost. Such findings of "value" have been affirmed by the state supreme court.

The remaining states in this category employ original cost as the measure of value. In California, Wisconsin, Utah, Arkansas, and Oklahoma this use of original cost has met with judicial approval. The California and the Massachusetts commissions followed original cost even when Smyth v. Ames was the "law of the land," and they assumed a major role in eliminating "fair value" as a constitutional requirement by successfully defending rate orders based on original cost before the Supreme Court of the United States. Recently the California Commission has on occasion increased the rate of return to compensate for "attrition," but in

86. Id. at 30, 152 A.2d at 43. For construction of the New Jersey act requiring fair value, see New Jersey Bell Tel. Co. v. Department of Pub. Util., 12 N.J. 568, 97 A.2d 602 (1953).
general it has adhered to original cost. The Wisconsin Commission was also an early advocate of original cost. Prior to Hope the state supreme court at first approved this policy, but later required fair value; after Hope the court reaffirmed its allegiance to original cost. The Utah Commission accepted original cost soon after Hope, and the Utah Supreme Court affirmed in an unusually comprehensive and penetrating opinion. Experience in Arkansas parallels that in Utah, except that the Arkansas version of original cost is cost to the utility.


When the economic value of utility property had been destroyed because of decline in the demand for its services, the Commission adopted the price at which the owner offered to sell the property as the rate base. Market St. Ry. v. Railroad Comm'n, 24 Cal. 2d 378, 150 P.2d 196, aff'd, 324 U.S. 548 (1945).


In Salt Lake City Lines, 30 P.U.R.3d 319 (Utah Pub. Serv. Comm'n 1959), the Commission employed both original cost and the operating ratio to test the reasonableness of transit fares.

homa the supreme court held that no single formula has to be followed in rate-making and thus left the Commission free to use original cost. The valuation statutes in Idaho, Colorado, Nevada, and Oregon have not been definitively construed by the courts in the period after Hope; the commissions in all these states employ original cost as the rate base.


E. ORIGINAL COST ASSOCIATED WITH RATES

Original cost or its equivalent is explicitly bound to rate-making by statute in five states—New York, Missouri, North Dakota, Florida, and Maine—and by the state constitution of New Mexico. The New York Public Service Law provides that “in determining the price to be charged for gas or electricity the commission may consider all facts which in its judgment have any bearing upon a proper determination of the question . . . with due regard among other things to a reasonable average return upon capital actually expended . . . .”98 The Missouri statute is nearly a duplicate.99 The New York Commission has consistently employed original cost since Hope; this policy is so firmly entrenched that it has not been challenged before either the Commission or the courts.100 But when the Missouri Commission adopted original cost under the act, the state supreme court reversed and required consideration of reproduction cost in establishing a rate base.101 Under the North Dakota act,102 which unequivocally defines “value” as “the money honestly and prudently invested,” the Commission uses original cost103 and, although valuation has not been in controversy, judicial approval has at least been suggested.104 The Florida statute governing gas and electric

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98. N.Y. PUB. SERV. LAW § 72 (1951). Other sections of the New York Public Service Law having similar provisions applicable to other utilities are: § 49 (railroads, including street railways); § 63(b) (omnibus companies); § 79 (steam corporations); § 89(j) (waterworks corporations).
102. N.D. CENT. CODE § 49-06-02 (1960).
104. Montana-Dakota Util. Co. v. Public Serv. Comm’n, 102 N.W.2d 329 (N.D. 1960). An earlier statute provided that rates shall yield a fair return on the “value” of the property, but did not define “value.” The state supreme court held both prior to and after Hope that conventional fair
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rates\textsuperscript{105} is essentially similar to North Dakota's, and the Florida Supreme Court has affirmed use of original cost by its Commission.\textsuperscript{106}

The Maine statute is unique. It provides for "reasonable value" as the rate base and directs the Commission to determine such value after "due consideration to evidence of the cost of the property when first devoted to public use, prudent acquisition cost to the utility, less depreciation on each, and any other factors or evidence material and relevant thereto but such other factors shall not include current value."\textsuperscript{107} The Commission construed "reasonable value" as a judgment figure predicated on both original cost when first devoted to public use and acquisition cost, the weight to be given each factor depending upon the evidence. The Maine Supreme Court declared that the Commission had the duty of giving consideration to both factors and any others "material and relevant" except "current value."\textsuperscript{108} This exception signifies clearly that reproduction cost is not an element in the rate base.\textsuperscript{109}

The New Mexico Constitution states that in "fixing rates of telephone and telegraph companies, due consideration shall be given to . . . earnings, investment and expenditure . . ."\textsuperscript{110}

The New Mexico Supreme Court has held that "investment" means value was the rate base. Northern States Power Co. v. Board of R.R. Comm'rs, 71 N.D. 1, 298 N.W. 423 (1941); Northern States Power Co. v. Public Serv. Comm'n, 73 N.D. 211, 13 N.W.2d 779 (1944). The present law was enacted in 1945.

\textsuperscript{105} FLA. STAT. § 366.06 (1958). For telephone statute, see text accompanying note 115 infra.


\textsuperscript{107} ME. REV. STAT. ANN. ch. 44, § 18 (Supp. 2, 1961). After Hope and prior to 1953, the statute specified fair value as the rate base, but did not define the term. Laws of Me. 1944, ch. 400, § 16. In 1953 the act was amended to provide "reasonable value" as the rate base and the Commission directed to give "due consideration to evidence . . . [of the] cost to the utility, current value thereof, less depreciation on each, and any other factors or evidence material and relevant thereto." Laws of Me. 1953, ch. 377, § 2. Interpretations of this provision include Central Me. Power Co. v. Public Util. Comm'n, 150 Me. 257, 109 A.2d 512 (1954), which required conventional fair value.


\textsuperscript{110} N.M. CONST. art. 11, § 7.
the "value of the property used in the business, for rate-making purposes, and has no reference to any particular formula."

The court also said that use of the word "investment" does not force the Commission to employ original cost. It has affirmed the Commission in rejecting reproduction cost as the rate base, declaring that evidence of reproduction cost was admissible and relevant although such cost could not under the law serve as the rate base. The Commission apparently construes the law as permitting original cost as the rate base.

F. REASONABLE RATES UNASSOCIATED WITH VALUATION

Statutes in twelve states make no mention of valuation. Under the eleven of them that require only that rates be just and reasonable, the regulatory agencies use original cost as the rate base. They may be grouped in two categories, one comprised of eight statutes that apply to all utilities within the state and the other consisting of three statutes that apply only to utilities particularly specified. In the remaining state, Iowa, municipalities regulate rates pursuant to authority delegated by the state legislature, which specifies no rule of rate-making. The Iowa Supreme Court has held that the due process clause in the state constitution requires fair value as the rate base.

Under statutes in the first category, the use of original cost has been explicitly affirmed by the courts of New Hampshire,

115. FLA. STAT. §§ 364.03, .14 (1958) (relating to telephone rates); MICH. COMP. LAWS § 484.103 (1948); MINN. STAT. § 221.041 (1961) (relating to street railways). For the telephone statutes, see text accompanying notes 19-22 supra.
Rhode Island, and Louisiana. In Vermont judicial approval can be reasonably inferred, while in Connecticut, Virginia, West Virginia, and Tennessee, valuation has not


been passed upon by appellate courts in the period under review.

The second category embraces the Minnesota, Florida, and Michigan enactments. Under the Minnesota act, which applies to street railways, the state supreme court affirmed a Commission valuation on original cost, but declared by way of dictum that reproduction cost is an element that the Commission should give the weight it considers proper to meet the requirements of the act. The Florida and Michigan statutes govern telephone rates; in the former the supreme court has upheld original cost as the rate base, while in the latter the appellate courts have not passed on the issue since Hope. However, the Commission has generally adhered to original cost in its decisions since Hope.

II. VALUE AND OPERATIONALISM

The basic reason for the diversity and confusion in valuation for public utility rate-making has been the failure to define "fair value" in operational terms. In Smyth v. Ames the Supreme Court said:

We hold . . . that the basis of all calculations as to the reasonableness of rates . . . must be the fair value of the property . . .

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125. Minneapolis St. Ry. Co. v. City of Minneapolis, 251 Minn. 43, 65-73, 86 N.W.2d 657, 672-77 (1957). In issue was valuation of structures, some of which were old, others new. Since the original cost of new structures represented present day costs, the court said "we cannot say that the commission acted unjustly or unreasonably in accepting book value . . . of all buildings, new as well as old." Id. at 67, 86 N.W.2d at 673. In Northern States Power Co. v. City of St. Paul, 256 Minn. 489, 497, 99 N.W.2d 207, 213 (1959), the Minnesota Supreme Court said "whether the original cost, reproduction cost, or fair value should be used as a rate base we need not now determine." See also Minneapolis St. Ry. Co., 31 P.U.R.3d 141, 150-53 (Minn. R.R. & Warehouse Comm'n 1959).


And in order to ascertain that value . . . [certain factors such as original cost, replacement cost, etc.] are all matters for consideration, and are to be given such weight as may be just and right in each case. 128

Subsequent statutory and judicial pronouncements holding fair value to be the rate base employ substantially the same language. They do not include the essentials of an operational concept.

In general, we mean by any concept nothing more than a set of operations; the concept is synonymous with the corresponding set of operations. . . . [W]e must demand that the set of operations equivalent to any concept be a unique set, for otherwise there are possibilities of ambiguity in practical applications which we cannot admit. 129

It is obvious that the instruction that is the essence of “fair value”—to give the matters for consideration (principally original cost and reproduction cost) such weight as may be just and right—is not operational. It offers no criterion or rule to determine what is “just and right” and, therefore, does not provide a method to ascertain a uniquely determinate value of the weight to be assigned to each of the “matters for consideration” in a finding of fair value. In practice, the weights attributed to original cost and reproduction cost in the application of the fair value concept are the results of a purely subjective and arbitrary process, which is characterized euphemistically as the “judgment” of the regulatory authorities. The weights vary from jurisdiction to jurisdiction and from case to case within the same jurisdiction. The fact is that fair value is an indeterminate magnitude lying anywhere between original cost and reproduction cost.

This indeterminacy is clearly demonstrated by the findings of fair value by those agencies committed to its use when valuation has been in controversy. The Illinois Commission has assigned one-quarter weight to reproduction cost and three-quarters to original

128. 169 U.S. 466, 546–47 (1898). This definition is not merely non-operational; it is not a correct definition in any sense. “For a term to be correctly defined its fully expanded definition must be a grammatically correct sentence that contains except for the term itself only undefined [sic] descriptive terms.” BERGMANN, PHILOSOPHY OF SCIENCE 50 (1957). The Court’s direction to ascertain fair value does not include the properly defined descriptive terms that are the essentials of a correct definition; all subsequent statutory and judicial pronouncements holding fair value to be the rate base employ substantially the same language as quoted above and, therefore, are definitionally defective.

129. BRIDGMAN, THE LOGIC OF MODERN PHYSICS 5–6 (1927). Furthermore, an operational definition means that “we have to describe a set of . . . operations, which we must carry out, in order to assign in every individual case a uniquely determinate value to the concept.” FRANK, PHILOSOPHY OF SCIENCE 52 (1957).
cost;\textsuperscript{130} Alabama has assigned one-third to reproduction cost and two-thirds to original cost;\textsuperscript{131} Minnesota, Delaware, Pennsylvania and Arizona have given approximately equal weight to each element.\textsuperscript{132} North Carolina and Indiana have also attributed equal weight to each in some proceedings, but in others have given greater weight to original cost.\textsuperscript{133} New Mexico, Maryland, and New Jersey have used original cost as the principal factor and added an increment to compensate for reproduction cost,\textsuperscript{134} while Missouri has given "greater weight" to original cost than to reproduction cost.\textsuperscript{135} And in Kentucky, Nebraska, and Montana, where the statutes also require fair value, no generalization at all can be made concerning the findings of the regulatory authorities.\textsuperscript{136}

In the absence of an operational method for measuring fair value, controversy in valuation proceedings is naturally stimulated since each party to the dispute can hope to persuade the regulatory agency to give weight to the factors most in its interest. As a consequence, the agency finds itself in the position of a referee or arbitrator, and its findings of fair value usually reflect a compromise between exaggerated claims rather than the result of an application of economic principles for rational rate-making.

III. VALUE OF CAPITAL AND COST OF CAPITAL

The concern with "value" has not only produced wide diversity in measurement of the rate base, but has also led the regulatory authorities astray as to the correct objective of valuation. That objective is simply to state the cost of the use of capital, whereas in "value" jurisdictions the value of capital facilities is treated as though its measure has an intrinsic meaning and purpose. Cost of capital—the economically appropriate and therefore necessary return to investors—may be expressed as a function of two variables, the rate base and the rate of return. But specification of the rate base is only a means to stating the cost of capital in a particular way. Insistence that value (fair value) is inherently meaningful, and must therefore serve as the rate base, ignores its purely instrumental role and mistakenly conceives the objective of valuation to be the discovery of some intrinsic worth of existing property.

\textsuperscript{130} See cases cited note 82 supra.
\textsuperscript{131} See cases cited note 16 supra.
\textsuperscript{132} See cases cited notes 22, 48, 76, 79 supra.
\textsuperscript{133} See cases cited notes 17, 51, 52 supra.
\textsuperscript{134} See cases cited notes 20, 33, 85 supra.
\textsuperscript{135} See cases cited note 101 supra.
\textsuperscript{136} See cases cited notes 19, 57, 58, 83 supra.
This misdirected concern with value in rate proceedings is traceable directly to the statement of the Supreme Court in *Smyth v. Ames* that "the basis of all calculations as to the reasonableness of rates . . . must be the fair value of the property being used . . . for the convenience of the public" and to the requirement that rates must yield a fair return on fair value. Implicit in this requirement is the fallacious assumption that capital invested in a utility has for rate-making purposes a determinable objective value and that the return due investors is some unique function of that value. Actually, as the Kentucky Court of Appeals has observed, once any reasonable measure of the invested capital or the rate base is specified, the allowable rate of return applied to it can be adjusted so that the numerical product of the two approximates the appropriate return to capital.

From the viewpoint of economic welfare, the appropriate return to capital in any public utility is that which is just sufficient to attract the funds required to meet the continuing socially justified needs of the particular utility. In economic language, this return is the opportunity cost of capital—the highest competitive value-product it could have created in alternative employment. Opportunity cost derives from the basic principle of the rational use of resources, which is that the assignment of a unit of resource to a particular production process is justified only if the value of its output in that process is no less than the value of any alternative output foregone. Thus the sacrifice of the most valuable possible alternative product attributable to a unit of capital is its opportunity cost. For practical purposes it is measured by the price utilities must pay in the money markets where they compete with other industries for investors' funds. The "end result" doctrine of *Hope* is a workable approximation of the opportunity cost principle. A return which enables a utility to maintain its financial integrity and to attract capital is equivalent to the opportunity cost of capital regardless of the rate base. In *Hope* the Court was not concerned with the "various permissible ways in which any rate base on which the return is computed might be arrived at." But since the return is expressed as a function of a rate of return and a rate base, some rate base is essential.

Three principal concepts compete for acceptance as the ap-
appropriate rate base: fair value, reproduction cost, and original cost. Fair value is undesirable because it is a non-operational concept and because of certain infirmities inherent in reproduction cost that are relevant insofar as it is an ingredient in fair value. However, it is not true, as often charged, that fair value as usually employed in rate-making involves circularity. Fair value must in this respect be distinguished from exchange value, which is dependent upon earnings or anticipated earnings and which thus cannot logically serve as the basis for determination of earnings. For example, cost to the utility of facilities previously employed is dependent upon anticipated earnings and is inadmissible as the rate base. But fair value is derived from “due consideration” of original cost when first devoted to the public service and from reproduction cost, neither of which depends upon earnings. Even though free of circularity, however, fair value is objectionable as the rate base.

Use of reproduction cost is predicated on either or both of two propositions: (1) utility rates should be governed by the present or prospective cost of producing the service, including the present or prospective cost of plant construction; (2) in a period of inflation investors in utilities’ securities (particularly in common stock) should be compensated for the decline in the purchasing power of their money income. Neither proposition is supportable on economic grounds. Present or future costs associated with existing plant should not properly determine product prices since the operating expenses of such a plant, which in reality would not be reproduced in view of technological progress, exceed those of a modern efficient substitute. But the adoption for rate-making of the estimated costs associated with a hypothetical optimum-technology plant has been consistently rejected by courts and commissions. Although sound in economic theory, it would introduce into rate proceedings evidence even more conjectural and controversial than estimates of the reproduction cost of existing plant. Apart from this practical obstacle, however, the proposal emphasizes that the operating expenses of existing plant are excessive as compared with those of a modern efficient plant, a fact that nullifies the economic validity of using the cost of reproduction.

142. For example, the Supreme Court in Hope said: “The heart of the matter is that rates cannot be made to depend upon ‘fair value’ when the value of the going enterprise depends on earnings under whatever rates may be anticipated.” Id. at 601.
144. The cost curves used in economic analysis of price determination necessarily assume optimum technology. See Stigler, op. cit. supra note 140, at 141.
ing the existing plant as a rate base while implicitly assuming continuation of current operating costs. It is illogical to relate one category of costs (operating expenses) to current conditions and relate another (capital cost) to future or hypothetical conditions.

Resort to reproduction cost in order to shelter investors in public utilities' securities from the impact of inflation is both discriminatory and unnecessary. It is unnecessary because the same end can be achieved directly, without the illogical distortion of the use of reproduction cost, by using original cost as the rate base and simply raising the rate of return to compensate for inflation. But in any case, investors in utilities should not be afforded this bounty, for like other investors they assume all risks associated with their investment, including inflation, when they purchase securities in the open market. No economic principle is discernible to endow them with the special privilege of compensation for the declining purchasing power of their money incomes—a privilege, incidentally, that would be confined to owners of the utilities' common stock only under the proposed arrangement.

The most desirable rate base is original cost when first devoted to public service. Its qualification for this role is essentially practical, as has been frankly acknowledged by the Wisconsin Commission, and its advantages in this respect are obvious. Original cost can be readily ascertained from accounting records; therefore it does not require conjecture and hypothetical estimation as reproduction cost does. It has speed and efficiency in application and does not entail the delay and costliness characteristic of proceedings involving estimates of reproduction cost, features that tend to undermine the efficacy of rate regulation. These practical advantages alone constitute a conclusive case for original cost.

Original cost is also a more desirable rate base than reproduction cost from the viewpoint of economic principle since it is more likely to lead to the closest feasible approximation of the opportunity cost of capital, despite having the defect, like reproduction cost, of relating to existing plant instead of a modern efficient substitute. At the root of the argument for reproduction cost is the assumption that the price level and unit construction costs will continue to rise and these are probable occurrences. A rising

146. The claim for reproduction cost as the rate base, predicated on the impact of inflation, differs from the claim for compensation for "attrition." Attrition is usually associated with an original cost rate base. The difference between the two can best be clarified by the following illustrations.

A. Reproduction cost. Assume that in 1961 the original cost per unit of plant is $100 and the allowable rate of return as fixed by the regulatory
price trend means a continuing increase in the reproduction cost of existing plant and a greater and greater total return to investors is necessary in order to attract funds to enable the utility to maintain its rate of output in the long run; so the argument goes. But this anticipation ignores technological progress as a factor to offset increasing prices. Such progress tends to reduce the real cost (total real resources) of replacing existing plant even in the absence of improvement and, at the same time, it develops new and more efficient equipment, which permits the continued level of output to be produced with a less costly (in terms of resource use) set of plant facilities. Although the new plant facilities are generally costlier than the old in monetary terms (and perhaps even in real terms), they are also typically of greater capacity as the economy and the scale of operation expand. Whether the cost-reducing effects of technological innovation are more or less than the cost rise in the prices of labor and construction material is uncertain. The fact that estimates of reproducing existing plant make no provision for the deflating effects of future technological improvements on operating costs raises at least the possibility that the use of such estimates as a factor in determining the return to investors may lead to capital cost in excess of opportunity cost. Insofar as reproduction cost is used as an element in "value" or "fair value," the same conclusion applies to these measures of the rate base.

In contrast, original cost does appear to have furnished a safe guide for rational resources allocation. A test of the adequacy of the return to investors when based on original cost can be formulated in the form of a question in economic terms: is the utility for

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agency and actually earned is 6%. In 1962 the cost of reproducing the identical plant is $105 per unit; the allowable rate of return is again found at 6%, which is still being earned on a base of $100 per unit of plant. The justification asserted for reproduction cost as the rate base in this situation is that $100 invested in 1961 is worth $105 in 1962 and that the investor is entitled to a return of 6% on $105.

B. Attrition. Assume that in 1961 the original cost per unit of plant is $100 and the allowable rate of return as fixed by the regulatory agency and actually earned is 6%. In 1962 a new plant is installed, either as replacement of a retired plant or as addition to existing plant, at a cost of $105 per unit. Then, all other things remaining the same, the actual return in 1962 will be less than 6%; the rate of return on the new plant will drop from 6% to 5.71% and this drop reduces the rate of return on the original cost of the entire plant below 6%. State v. New Jersey Bell Tel. Co., 30 N.J. 16, 27, 152 A.2d 35, 41 (1959).

The basic distinction between A and B is that in A the utility is in 1962 earning the allowable return on original cost, whereas in B it is not. The problem in B is to anticipate the increase in future investment costs when rates are being prescribed in 1961 in order to avoid the initiation of rate proceedings in 1962.
which rates are prescribed still able to raise capital funds sufficient to meet its needs? If it can, the use of original cost as the rate base and of current or prospective yields on securities as the rate of return is appropriate. Experience in the original cost jurisdictions indicates that this approximation to the opportunity cost of capital has in fact proved adequate. A higher rate of return to investors resulting from the use of reproduction cost would be contrary to sound economic principle, for it would price utility services in excess of their true opportunity cost and would thus cause the quantities of such services produced and purchased to be less than the proper amounts when judged in terms of consumers’ welfare. Only the actual withdrawal of investment funds as a consequence of the use of original cost as the rate base would demonstrate that the opportunity cost of capital is not being met. There is no evidence that such inadequacy has resulted from the use of original cost as the rate base.

CONCLUSION

The evidence reveals an extreme diversity in the application of valuation methods for public utility rate-making. It is true that in economic and social matters diversity generally is not necessarily undesirable. When it results from experiment, it may bring progress. The federal system has been regarded as peculiarly suitable for experiment since any state may serve as a laboratory without risk to the rest of the country. But diversity in the principles and determinations of valuation has been, and continues to be, the result of confusion. Its common underlying aberration is concern for a fictitious inherent "value" of capital as an ultimate objective of discovery. Conceived in this way, as a quasi-economic term with a vague but persistent ethical context, it is almost inevitably non-operational. The confusion that follows can and should be removed by uniform legislation prescribing original cost as the rate base with the understanding that this is simply a first step in arriving at and expressing the true objective of rate-making investigation—the opportunity cost of the use of capital.
