THE DISCOUNTED CASH FLOW METHODOLOGY: ITS USE IN ESTIMATING A UTILITY'S COST OF EQUITY

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I. INTRODUCTION

The Supreme Court's *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia (Bluefield)* [1] and *Federal Power Commission v. Hope Natural Gas Co. (Hope)* [2] decisions, as recently reinforced in its *Duquesne Light Co. v. Barasch (Duquesne)* decision,[3] set the standard for judging the lawfulness of equity returns authorized for utilities by ratemaking agencies. Under the *Bluefield-Hope* standard, the equity return must enable the utility to (1) attract additional capital on reasonable terms (the capital attraction standard); and (2) realize a return on equity commensurate with the returns earned by enterprises with comparable risks (the comparable earnings standard).[4] In "reaffirming these teachings of *Hope*," the *Duquesne* Court noted that "[o]ne of the elements *always relevant* to setting the rate under *Hope* is the return investors expect given the risk of the enterprise."[5] Similarly the D.C. Circuit, which reviews most ratemaking decisions of federal agencies, has admonished that a "[c]ommission is required to set a rate of return commensurate with other enterprises of comparable risk and sufficient to assure that enough capital is attracted to the utility to enable it to meet the public's needs."[6]

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1. 262 U.S. 679 (1923).
2. 320 U.S. 591 (1944).
3. 488 U.S. 299 (1989).
4. *See Bluefield*, 262 U.S. at 692; *Hope*, 320 U.S. at 603 ("[T]he 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 to attract capital."); *see also* Leventhal, *Vitality of The Comparable Earnings Standard for Regulation of Utilities in a Growth Economy*, 74 YALE L.J. 989, 992 (1965).

The *Bluefield-Hope* standards are constitutional standards, that is, they define "the point at which a rate becomes unconstitutionally confiscatory. . . ." Jersey Cent. Power & Light Co. v. FERC, 810 F.2d 1168, 1175 (D.C. Cir. 1987) (*en banc*).

5. *Duquesne*, 488 U.S. at 314 (quoting *Hope*, 320 U.S. 591; *Bluefield*, 262 U.S. 679) (emphasis supplied).

6. Boroughs of Ellwood City v. FERC, 731 F.2d 959, 967 (D.C. Cir. 1984); *see also* Tennessee Gas Pipeline Co. v. FERC, 926 F.2d 1206, 1208 (D.C. Cir. 1991) ("[U]tility investors must be allowed an opportunity to earn returns sufficient to 'attract capital,' . . . and 'to compensate [the] investors for the risks assumed,' . . . .") (citations omitted); Anaheim v. FERC, 669 F.2d 799, 803-04 (D.C. Cir. 1981); NEPCO Mun. Rate Comm'n v. FERC, 668 F.2d 1327, 1344 (D.C. Cir. 1981), *cert. denied sub nom.* New England Power Co. v. FERC, 457 U.S. 1117 (1987).

Consistent with this legal requirement, ratemaking agencies and cost-of-capital witnesses typically used "comparable earnings" studies to estimate the fair return on equity for public utilities during the two decades immediately following the 1944 *Hope* decision. The Discounted Cash Flow (DCF) methodology—now the most widely used methodology for estimating the cost of equity for ratemaking purposes—was then only a nascent concept.[7] Textbooks on public utility ratemaking, for example, did not start including discussions of the DCF approach until the early 1970s.[8]

The first DCF advocates in rate proceedings were witnesses for ratepayers in the mid-1960s.[9] They recognized a mathematical side effect of the DCF formula which tended to depress the indicated return on equity. Specifically, DCF produces a cost of equity that, if translated directly into the authorized return on equity, tends to drive the market price of a utility's stock to its book value.[10] As utilities were then typically trading above book value,[11] a ratepayer witness could prove that the utility was earning too much and not too little. Most commissions, nevertheless, rejected such proof concluding, as the Federal Communications Commission (FCC) did, that "[T]he DCF method *underestimates the fair return* on book equity since it produces a capitalization rate which, if applied directly to book equity, will produce a market price

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7. In its simplest form, the DCF formula is:

$$K_e = \frac{D}{P} + g$$

K_e = market cost of equity
D = expected dividend
P = current market price
g = expected growth rate

For more sophisticated versions of the DCF formulae *see* R. MORIN, UTILITIES' COST OF CAPITAL 73-141 (1984).

8. *See, e.g.,* E. NICHOLS, RULING PRINCIPLES OF UTILITY REGULATION (1955) (DCF not mentioned); E. NICHOLS AND F. WELCH, RULING PRINCIPLES OF UTILITY REGULATION (RATE OF RETURN SUPP. A 1964) (DCF not mentioned); J. BONBRIGHT, PRINCIPLES OF UTILITY RATES (1961) (DCF not mentioned); P. GARFIELD & W. LOVEJOY, PUBLIC UTILITY ECONOMICS (1964) (DCF not mentioned). Professor Kahn in his 1970 treatise refers to the DCF formula in a footnote and, then, reproduces Dr. Roseman's 1968 testimony explaining DCF. I A. KAHN, THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS 47-49 & n.67 (1970).

Extensive discussion of the DCF methodology is now common in recently published utility regulation textbooks. *See, e.g.,* A. KOLBE ET AL., THE COST OF CAPITAL: ESTIMATING THE RATE OF RETURN FOR PUBLIC UTILITIES (1984); R. MORIN, *supra* note 7; K. HOWE & E. RASMUSSEN, PUBLIC UTILITY ECONOMICS AND FINANCE (1982); C. PHILLIPS, JR., THE REGULATION OF PUBLIC UTILITIES: THEORY AND PRACTICE 356-58 (1984).

9. Dr. Myron Gordon, father of the "Gordon" DCF model, did not rely on the DCF methodology even as late as 1967. *See* Charges for Interstate and Foreign Communication Service, American Tel. & Tel. Co. and the Associated Bell Sys. Cos., 9 F.C.C.2d 30, 66-67 ¶¶ 139-142 (1967).

10. *See* R. MORIN, *supra* note 7, at 238-39; A. KOLBE ET AL., *supra* note 8, at 25-33; Kosh, *Recent Trends in Cost of Capital,* 72 PUB. UTIL. FORT. 19, 21-26 (Sept. 26, 1963); Morton, *Growth in Earnings Per Share From Sale of Stock Above Book Equity,* 85 PUB. UTIL. FORT. 24, 25 n.1 (Jan. 29, 1970).

11. Book value means the "original paid-in capital contribution of equity shareholders plus any retained earnings. It therefore represents the net underlying value of the company's assets in original cost terms." Farmers Union Cent. Exch., Inc. v. FERC, 734 F.2d 1486, 1522 n.69 (D.C. Cir.), *cert. denied sub nom.* Association of Oil Pipe Lines v. Farmers Union Cent. Exch., Inc., 469 U.S. 1034 (1984) (citations omitted) [hereinafter Farmers Union II].

equal to book equity."[12]

When utility stocks began trading below book value in the early and mid 1970s (*see* Chart A), the DCF methodology quickly became *the* methodology.

Chart A
Market-To-Book Ratios
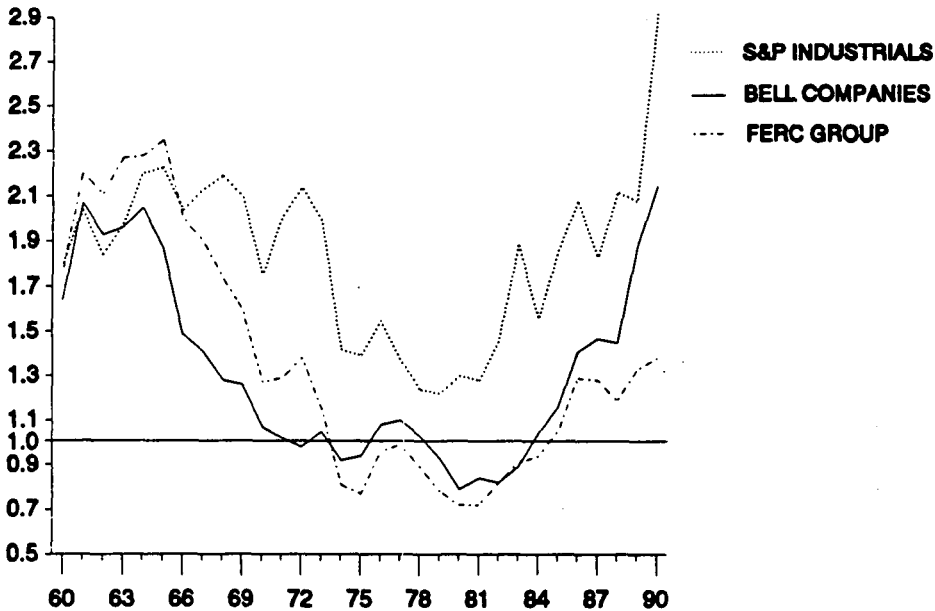
Utilities found DCF attractive because the formula produced, at least in theory, a return level that would drive the market price *up* to book value. As a result, comparable earnings witnesses were shunned and utilities presented a new flock of rate-of-return witnesses advocating the DCF methodology instead.

Ratemaking agencies, no longer confronted with utility opposition, quickly gravitated to the DCF methodology. At last, they had a consensus formula that "solved" the most perplexing problem in the ratemaking process: the determination of a fair return on equity.[13] By the early 1980s, when utility stocks were still trading below book value, 92% of the utilities and 97% of the state commissions in one survey reported that they relied on the DCF

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12. Charges for Interstate Telephone Service, American Tel. & Tel. Co., 57 F.C.C.2d 960, 970 ¶ 38 (1976).

13. *See* Leventhal, *supra* note 4, at 989 ("Among the most complex and searching problems of modern government is the delineation of standards for determining the 'fair return' to be accorded a privately owned company the prices or rates of which are being regulated."); Generic Determination of Rate of Return on Common Equity for Electric Utilities, 49 Fed. Reg. 29,946, 29,948 (1984) ("Measuring the cost of equity is a difficult task and likely to be imperfectly done under any conceivable procedure.").

methodology.[14]

Later in the mid-1980s, however, the DCF's market-to-book mathematics began turning against the utilities. Telephone utilities and most electric utilities began trading above book value, and today they trade significantly above book value although at noticeably thinner market-to-book ratios than nonregulated companies.[15]

Amazingly, the vast majority of utilities—even those trading at significant premiums over book value—continue to cling to the DCF methodology. In the generic rate of return proceedings before the Federal Energy Regulatory Commission (FERC or Commission) in 1986[16] and before the FCC in 1985,[17] every utility filing comments endorsed the DCF methodology for estimating the cost of equity. Since then both the FERC and the FCC have routinely applied the DCF methodology in rate proceedings, even over the occasional vigorous objection of the utility.[18] Most amazing is that no utility has asked the D.C. Circuit to rule on the use of the DCF methodology, even after that court virtually invited a challenge to the reasonableness of using the

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14. *See* Dukes & Chandy, *Rate of Return and Risk for Public Utilities*, 112 PUB. UTIL. FORT. 35 (Sept. 1, 1983).

15. The S&P Industrials series includes approximately 400 nonregulated companies. The Bell Companies includes AT&T before the 1984 divestiture of the Bell Operating Companies and since 1984 the seven publicly traded Bell regional holding companies. The FERC Group includes the 87 electric companies listed in the FERC's first quarter 1991 DCF benchmark computation for the 1972-1990 period (Generic Determination of Rate of Return on Common Equity for Public Utilities, 56 Fed. Reg. 15,998 (1991)) and Moody's 24 utilities for the pre-1972 period.

16. Notice of Proposed Rulemaking, *Generic Determination of Rate of Return on Common Equity for Public Utilities*, IV F.E.R.C. Stats. & Regs. ¶ 32,429, 51 Fed. Reg. 27,050 (1986) [hereinafter *FERC Generic Notice*]; Order No. 461, *Generic Determination of Rate of Return on Common Equity for Public Utilities*, Regulations Preambles 1986-1990 ¶ 30,722, 52 Fed. Reg. 11 (1987) (codified at 18 C.F.R. pt. 37) [hereinafter *FERC Final Generic Rule*], *order on reh'g*, Order 461-A, 38 F.E.R.C. ¶ 61,160, at 61,439 (1987) [hereinafter *FERC Generic Rehearing Order*].

It is hard to tell whether the FERC presently relies exclusively or primarily on DCF because in most cases only DCF evidence is presented. In one recent decision, however, the FERC rejected an argument that it should rely solely on DCF and concluded that it was "fully justified in accepting Staff's CAPM and Comparable Earnings studies as additional methodologies [to DCF] . . . in establishing a range of reasonable rates of return." Williston Basin Interstate Pipeline Co., 50 F.E.R.C. ¶ 61,284, at 61,913 (1990). The Commission went on to point out that "the DCF methodology itself is *never* a foolproof method for accurately estimating the appropriate return. . . ." 50 F.E.R.C. at 61,913 n.90 (emphasis supplied). More recently, however, the D.C. Circuit observed that the FERC "appears quite wedded to DCF. . . ." Tennessee Gas Pipeline Co. v. FERC, 926 F.2d 1206, 1211 (D.C. Cir. 1991).

17. Authorized Rates of Return for the Interstate Services of AT&T Communications and Exchange Telephone Carriers, 59 Rad. Reg. 2d (P&F) 651 (1985), *recon.*, 104 F.C.C.2d 1404 (1986).

In its 1976 *AT&T Rate Decision*, the FCC acknowledged that it could not "find any one computational approach so superior that we should adopt it as the only appropriate method for determining AT&T's cost of equity." *American Tel. & Tel. Co.*, 57 F.C.C.2d at 969 ¶ 35. In its 1981 AT&T rate proceeding, the FCC reaffirmed that ". . . no one method can be determinative of the appropriate return on Bell's equity capital. In the final analysis, we must apply our informed judgment to the range of estimates which we have found to be helpful indicators of the cost of equity." Petition for Modification of Prescribed Rate of Return, American Tel. & Tel. Co., 86 F.C.C.2d 221, 246-47 ¶ 71 (1981) (citation omitted).

18. *See, e.g.*, Orange and Rockland Utils., Inc., 44 F.E.R.C. ¶ 61,253, at 61,951-53 (1988); Represcribing the Authorized Rate of Return for Interstate Services of Local Exchange Carriers, 5 F.C.C. Rcd 7507, 7519-21 ¶¶ 103-20 (1990) [hereinafter *FCC 1990 Rate of Return Prescription Proceeding*].

DCF methodology in setting a utility's equity return level.[19]

A reexamination is in order. In 1970, Dr. Walter Morton, a giant in the rate of return field at the time, pointed out that "[e]lementary arithmetic shows that [DCF] . . . cannot . . . satisfy the expectations of any investor who pays a market price above book."[20] Another financial expert in that era, Dr. Ezra Solomon, labelled the application of the "cost of equity in DCF units" to a net book value estimate (or one based on net book value) a "misuse" of the DCF methodology.[21] More recently, and at a more sophisticated level, Drs. Kolbe and Tye have demonstrated that the DCF methodology systematically understates the cost of equity capital in a ratemaking context.[22]

This article examines the use of DCF in rate proceedings from an evidentiary and legal perspective, and leaves the economist's perspective to Dr. Kolbe, Dr. Tye and others. Section II tests the core assumptions underlying the DCF methodology against the available facts, both academic and real world. If the key assumptions upon which a formula is premised prove invalid, an agency's reliance on that formula is unreasonable and unlawful.[23] Section III addresses anomalies in the application of DCF in rate proceedings, particularly the current ratemaking convention of multiplying a "market-required" return (which is what the DCF methodology purports to generate) times a depreciated original cost rate base to determine a utility's revenue requirements. Such a combination runs afoul of the rule that an agency's rate of return formula must be "reasonably related" to the agency's rate base methodology.[24] Section IV looks at the DCF methodology in terms of the applicable legal standards, including the *Bluefield-Hope* standard and the "end-result" test. Section V explores a comparable earnings alternative to the DCF formula in arriving at a fair return on equity in a net original cost jurisdiction.

II. DCF's CORE ASSUMPTIONS

The DCF methodology rests on the premise that the current market price of a company's stock equals the present value of the cash flows that investors expect from that stock, discounted at their required return.[25] Thus, DCF theory postulates that, in equilibrium, the return expected by shareholders "is

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19. *See* Public Serv. Comm'n of N.Y. v. FERC, 813 F.2d 448, 463 n.22 (D.C. Cir. 1987), where the Court stated:

We frankly do not understand the Commission's use of a Discounted Cash Flow technique to calculate the investors' expected rate of return. We thought that "discounted cash flow" was, instead, a method of determining the present value of a future income stream. Neither counsel for petitioner nor counsel for FERC was able to explain the Commission's analysis, but petitioner does not challenge the Commission's use of the DCF formula.

20. Morton, *supra* note 10, at 25 n.1.

21. Solomon, *Alternative Rate of Return Concepts and Their Implications for Utility Regulation*, 1 BELL J. ECON. & MGMT. SCIENCE 65, 79 (Spring 1970).

22. Kolbe & Tye, *The* Duquesne *Opinion: How Much 'Hope' Is There for Investors in Regulated Firms?*, 8 YALE J. ON REG. 113, 152-53 (1991).

23. *See, e.g.*, Tennessee Gas Pipeline Co. v. FERC, 926 F.2d 1206, 1210 (D.C. Cir. 1991).

24. Farmers Union II, *supra* note 11, at 1527.

25. R. MORIN, *supra* note 7, at 73-74; *see also* A. KOLBE ET AL., *supra* note 8, at 53-55; *also Tennessee Gas Pipeline Co.*, 926 F.2d at 1208 n.2.

implicitly embedded in the share price of that firm."[26] This, in essence, is the efficient market hypothesis (EMH): investors evaluate stock in a classical economic framework and trade securities rationally at prices reflecting that value assessment.[27] The validity of the efficient market hypothesis—DCF's core assumption[28]—appears to have escaped serious challenge in ratemaking proceedings.[29]

Another key DCF assumption has also, for the most part, remained unchallenged. That assumption postulates that a utility's equity return does not equal its cost of capital when the utility's stock trades either above or below book value. Specifically, DCF theory holds that a utility is earning monoply profits when its stock trades noticeably above book value.[30]

If either assumption proves invalid, or even highly questionable, a ratemaking agency cannot reasonably rely on DCF results in arriving at a fair return on equity. The next two subsections explore the factual basis for each central assumption.

A. The Assumption that the Efficient Market Hypothesis Is Valid

The DCF methodology is not sustainable as a rate-of-return formula unless the efficient market hypothesis is valid.[31] Only if that hypothesis is valid could an agency reasonably conclude that the market price ("P") element of the DCF formula reflects the cash flows anticipated by investors discounted at the investors' required return. Both the FERC and the FCC concede this dependency, but each rejects challenges to the EMH as contrary to "mainstream thinking."[32]

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26. R. MORIN, *supra* note 7, at 73; *see also* A. KOLBE ET AL., *supra* note 8, at 53-54.

27. R. MORIN, *supra* note 7, at 80, 120; *cf.* J. FRANCIS, INVESTMENTS: ANALYSIS AND MANAGEMENT 543-45 (5th ed. 1991).

28. R. MORIN, *supra* note 7, at 120 ("[T]he assumption of perfect markets which is embodied into DCF valuation models is validated by the existence of efficient markets.").

29. *But see* Foster, *Fair Return Criteria and Estimation*:

A crucial assumption of the DCF formula is that actual market prices are equal to the discounted present worth of future benefits expected by investors. Stock market performance suggests, however, that buy and sell decisions by investors reflect factors quite independent of the rational concept that market price is the present worth of anticipated benefits discounted at a rate which compensates for risk.

28 BAYLOR L. REV. 883, 912 (1976).

30. *See* A. KOLBE ET AL., *supra* note 8, at 25, 30-31.

31. *See, e.g.*, Tennessee Gas Pipeline Co. v. FERC, 926 F.2d 1206, 1210 (D.C. Cir. 1991) ("If the market is in fact unable to promptly reflect information so widely publicized as risk-free interest rates, DCF theory collapses."). In that decision the court appears to confuse the "informational efficient" market concept with the "fundamental value efficient" market concept. A market may be informationally efficient, but not efficient from a fundamental value standpoint. For a readable and excellent discussion of the difference, *see* Wang, *Some Arguments that the Stock Market is not Efficient*, 19 U.C. DAVIS L. REV. 341 (1986).

The DCF methodology is premised on the assumption that the market is "fundamental value efficient," that is, stock prices reflect the discounted present value of future dividend payouts. *See id.* at 344. Although a number of articles have been published attempting to prove the market is informationally efficient, the author is not aware of any articles purporting to demonstrate that the market is fundamental value efficient.

32. *FERC Final Generic Rule, supra* note 16, 52 Fed. Reg. at 30; *FCC 1990 Rate of Return*

In its generic rate of return proceeding, the FERC brushed off studies and evidence challenging the validity of the EMH with the circular argument that the results of such studies and evidence are fundamentally inconsistent with the efficient market hypothesis.[33] Is the FERC suggesting that it will only accept evidence of the EMH's invalidity if that evidence is consistent with the EMH? Not to be outdone in the circular reasoning department, the FCC recently rejected one party's offer of studies challenging the EMH on the basis that "no other party question[ed] the fundamental soundness of market-based approaches to determining the cost of capital."[34] Heretical positions apparently will be considered by the FCC only if presented by several parties.

Unfortunately for the commissions, "mainstream thinking" does not automatically equate to the "substantial evidence" necessary to sustain an agency rate decision.[35] Moreover, the evidence continues to mount that markets are not efficient. The legal standard to bear in mind is this: A ratemaking agency departs from reasoned decisionmaking when it blithely assumes the validity of a theory in the face of studies and other evidence challenging that theory's validity.

1. The Academic Studies

Recent empirical studies show that the market price of a stock at a given point in time typically does *not* reflect the fundamental value of that stock. The best known of these studies are by Dr. Robert Shiller, author of *Market Volatility*.[36] His studies demonstrate that the volatility of the stock market is far too great to be consistent with rationally determined stock prices:[37] "The failure of the efficient markets model is thus so dramatic that it would seem impossible to attribute the failure to such things as data errors, price index problems, or changes in tax laws."[38]

Later studies have reinforced Dr. Shiller's earlier conclusions.[39] Dr. Shiller found that "measures of stock price volatility over the past century" are

Prescription Proceeding, supra note 18, at 7521 ¶ 118. The FERC, however, apparently has no compunction about departing from the tenets of the EMH to achieve predetermined results. *See Tennessee Gas Pipeline Co.*, 926 F.2d at 1210-12.

33. *FERC Final Generic Rule, supra* note 16, 52 Fed. Reg. at 30.

34. *FCC 1990 Rate of Return Prescription Proceeding, supra* note 18, at 7521 ¶ 118. In a footnote, the FCC noted that the Supreme Court had "accepted the proposition that most experts accept the concept of an efficient market." Id. at 7538 n.192.

35. *See* Electricity Consumers Resource Council v. FERC, 747 F.2d 1511, 1517 (D.C. Cir. 1984).

36. R. SHILLER, MARKET VOLATILITY (1990).

37. Shiller, *Stock Prices and Social Dynamics*, Brookings Paper on Economic Activity 457 (1984); R. SHILLER, *supra* note 36, at 8 ("[T]he efficient markets hypothesis represents one of the most remarkable errors in the history of economic thought.").

38. Shiller, *Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?*, 71 AMERICAN ECON. REV. 421 (1981).

39. *See* Miller, *Bounded Efficient Markets: A New Wrinkle to the EMH*, 13 J. PORTFOLIO MGMT. 4 (1987); Summers, *Does the Stock Market Rationally Reflect Fundamental Values?*, 41 J. FIN. 591 (1986); LeRoy & Porter, *The Present-Value Relation: Tests Based on Implied Variance Bounds*, 49 ECONOMETRICA 555 (1981); *see also* Wang, *supra* note 31 (Professor Wang cites numerous studies questioning the validity of the efficient market hypothesis); Stout, *Are Takeover Premiums Really Premiums? Market Price, Fair Value, and Corporate Law*, 99 YALE L. REV. 1235 (1991).

"far too high—five to thirteen times too high—to be attributed to new infor-
mation about future real dividends. . . ."[40] For every subperiod examined, he
found that "stock prices move in a direction opposite to that forecasted by the
dividend-price ratio."[41]

Dr. Edward Miller's analyses show that the available evidence contra-
dicts the assumptions underlying the EMH.[42] Dr. Miller studied the "usual
answer of EMH . . . that trading by the well-informed keeps markets efficient
even though uninformed investors are trading." His results show that this "is
just not so."[43]

What the evidence does show is that price changes are, to a very signifi-
cant degree, "attribut[able] to psychological factors: investor overreaction to
earnings, dividends, or other news; waves of social optimism or pessimism;
fashions or fads," and the "herd" instinct.[44] That is, "[s]tock prices are likely
to be among the prices that are relatively vulnerable to purely social move-
ments because there is no accepted theory by which to understand the work of
stocks and no clearly predictable consequences to changing one's invest-
ments."[45] Thus, while over a period of decades stock prices may, on average,
reflect underlying values, this very likely is not the case over shorter periods.

2. The Real World Evidence

Black Monday, the stock market crash of October 19, 1987, left many
efficient market theorists "totally perplexed."[46] They could not explain why
the "market had remained so out of line with other assets . . . for so long
before the crash."[47] The EMH was declared dead, buried under "the weight
of recent empirical evidence. . . ."[48] In short, Black Monday shook the faith of
many remaining adherents to the efficient market hypothesis.

Since then, the EMH has been tested against reality in a number of
instances. For example, a study comparing Fidelity's Magellan Funds per-
formance to the S&P 500's performance led one finance professor to conclude
that the "Magellan Funds performance . . . stands as dramatically inconsistent
with the efficient market hypothesis."[49] Other studies have noted the idiosyn-
cratic market behavior occasioned by phenomena that now carry short-hand
labels such as the small firm effect, turn-of-the-year effect, low price-earnings
ratio effect, *Value Line* phenomenon, weekend effects, performance of low beta

40. Shiller, *supra* note 38, at 433-34; R. SHILLER, *supra* note 36, at 124.

41. R. SHILLER, *supra* note 36, at 35.

42. Miller, *supra* note 39, at 4.

43. *Id.* at 7.

44. Shiller, *The Volatility of Stock Market Prices*, 235 SCIENCE 33 (Jan. 1987); R. SHILLER, *supra* note
36, at 12.

45. Shiller, *supra* note 37, at 464.

46. Donnelly, *Efficient-Market Theorists Are Puzzled By Recent Gyrations in Stock Market*, WALL ST.
J., Oct. 23, 1987, at 7, col. 1.

47. *Id.* at 7, col. 3-4, quoting Dr. Shiller: "The efficient-market hypothesis is the most remarkable
error in the history of economic theory. This is just another nail in its coffin."

48. Jacobs & Levy, *The Complexity of the Stock Market*, 16 J. PORTFOLIO MGMT. 19, 22 (Fall 1989).

49. Marcus, *The Magellan Fund and Market Efficiency*, 17 J. PORTFOLIO MGMT. 85, 88 (Fall 1990).

portfolios, sector rotation, and information coefficients.[50] Investors engage in "program trading" and a host of other devices that result in buying and selling stock for reasons notoriously unrelated to the stock's value.

Ironically, DCF results, viewed in perspective, provide additional evidence undermining the validity of the EMH. Financial theory holds that the cost of equity (*i.e.*, the investor-required return) exceeds the cost of debt in an amount sufficient to compensate investors for the greater risk inherent in stocks.[51] Financial theory also holds that the relative "risk premium" demanded by investors does not change significantly through time. Thus, as interest rates increase or decrease, there should be a parallel increase or decrease in the investor-expected return on equity.[52]

The reality is that fluctuations in the DCF-indicated cost of equity do not parallel changes in interest rates. Dr. Kolbe, a DCF adherent at the time, noted: "There are many examples . . . in which the estimated cost of equity moves in the opposite direction from interest rates." He dismissed this counterintuitive evidence as simply a "great deal of 'noise' "![53]

Noise, indeed. Chart B graphically illustrates the divergences between interest rates and the DCF-indicated returns for the FERC utility group and the Bell Companies. These divergences are particularly telling in view of the commonly held belief that stocks of capital-intensive utilities are especially sensitive to interest rate changes.

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50. *See* J. FRANCIS, *supra* note 27, at 565-78.

51. *See, e.g.*, United States v. FCC, 707 F.2d 610, 612 (D.C. Cir. 1983).

52. *See* R. MORIN, *supra* note 7, at 28-44; Tennessee Gas Pipeline Co. v. FERC, 926 F.2d 1206, 1210 (D.C. Cir. 1984) ("Dividend yields can . . . be expected to move with interest rates so long as other things remain equal. . . .").

53. A. KOLBE ET AL., *supra* note 8, at 107.

Chart B[54]

DCF-INDICATED RISK PREMIUM
VIS-A-VIS Aa UTILITY BONDS

Basis Points

        ···· **FERC GROUP**

        — **BELL COMPANIES**

    Aa UTILITY BONDS

1985　1986　1987　1988　1989　1990
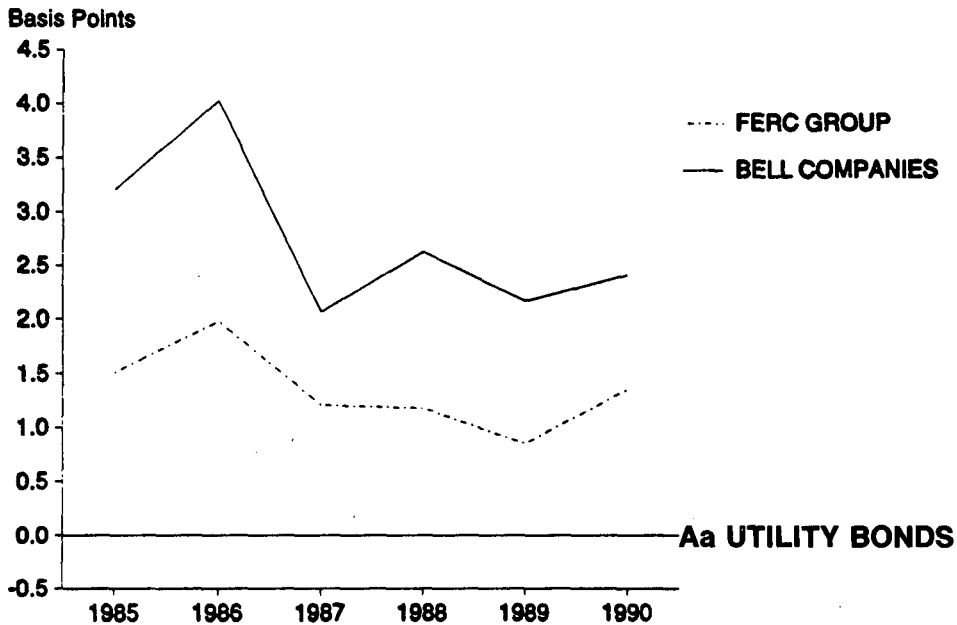
That the DCF-indicated risk premium lines for the FERC Group and Bell Companies do not parallel the Aa bond interest rate line means one of two things: financial theory is wrong, or application of the DCF methodology under current conditions yields highly skewed results. In either event, the lesson is the same. The DCF methodology does not provide a reliable basis for estimating a utility's current cost of equity.

At the micro level, DCF results defy other EMH/financial theory principles. In the *FCC 1990 Rate of Return Prescription* proceeding, one witness—a DCF proponent—presented a DCF study of 111 electric utilities. More than twenty of those electric utilities had DCF-indicated returns that were below the then-current yield on Aa electric utility bonds.[55] One utility, in fact, showed a *negative return*,[56] suggesting (absurdly) that investors are willing to pay those firms a dividend to be shareholders. Such results cannot be squared

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54. The Aa utility bonds line reflects average year-end interest rates for Aa utility bonds. The risk premiums for the FERC Group and Bell Companies were computed by subtracting the Aa interest rate from the average DCF-indicated returns for those two groups. The DCF returns for each company were computed by using year-end market price, year-end dividend rates and IBES growth rate.

55. Prepared Testimony of Ralph E. Miller, on behalf of the Consumer Coalition, at 8 & Table 2, FCC, CC Docket No. 89-624 (referenced in 5 F.C.C. Rcd 7507 (1990)) [hereinafter Miller Testimony].

56. *Id.*

with the EMH or the principle that the investor-required return on equity exceeds the current yield on the firm's debt securities.

Confronted with such studies and evidence, ratemaking agencies cannot assume the validity of the efficient market hypothesis and remain on the right side of the rule of law. Flawed formulas simply do not provide a reasoned basis for arriving at a reasonable return.[57]

B. *The Assumption that a Stock Price Above Book Value Evidences Monopoly Profits*

Under the DCF theory, a utility's stock should always trade at or very near its book value.[58] A one-to-one market-to-book ratio indicates, according to DCF theorists, that investors expect a company to earn its cost of capital—no more, no less. A ratio below one reveals that investors do not expect the firm to recover its cost of capital. A market price above book value is evidence that investors anticipate that the firm will earn more than its cost of capital. That is the theory. That theory, however, is at odds with reality.

1. The "Protect the Utility Shareholder" Theory

DCF theorists maintain that DCF's tendency to drive market value to book value is fair to utilities.[59] Their reasoning proceeds as follows. Utilities, unlike nonregulated companies, are obliged to construct and, therefore, finance the facilities necessary to meet the service needs of their customers.[60] Thus, when nonregulated companies' market-to-book ratios are less than one, the DCF methodology will indicate a return that will increase the utility's stock prices to book value, thereby safeguarding the utility's shareholders against forced dilution.[61] That being the case, DCF advocates argue, utilities are not entitled to earn a return yielding a market price above book value when nonregulated company stocks happen to be trading at a premium over book value.

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57. Electricity Consumers Resource Council v. FERC, 747 F.2d 1511, 1517 (D.C. Cir. 1984); *see also* ALLTEL Corp. v. FCC, 838 F.2d 551, 559 (D.C. Cir. 1988).

58. *See* R. MORIN, *supra* note 7, at 86.

59. *See, e.g.,* A. KOLBE ET AL., *supra* note 8, at 30-31; *FCC 1990 Rate of Return Prescription Proceeding, supra* note 18, at 7521 ¶ 117; *FERC Final Generic Rule, supra* note 16, at 30.

60. *See, e.g.,* Jersey Cent. Power & Light Co. v. FERC, 810 F.2d 1168, 1171 (D.C. Cir. 1987) *(en banc)* ("Regulated public utilities are under statutory obligations to plan and build the facilities necessary to meet the projected needs of their customers.").

61. See text accompanying note 71.

Stated another way, a utility investor obtains regulatory protection against extraordinary capital losses (selling below book value). The trade-off is that the investor forsakes the possibility of extraordinary capital gains (selling above book value). In other words, a utility's equity should trade at or very near book value at all times. The market-equal-to-book proponents assume the efficient market reflects over time the following relationships:[62]

CHART C-1

Hypothetical Market-to-Book
Ratios Assumed By DCF Advocates

Market-to-Book Ratio

Years

— Nonregulated Companies   ...... Utilities
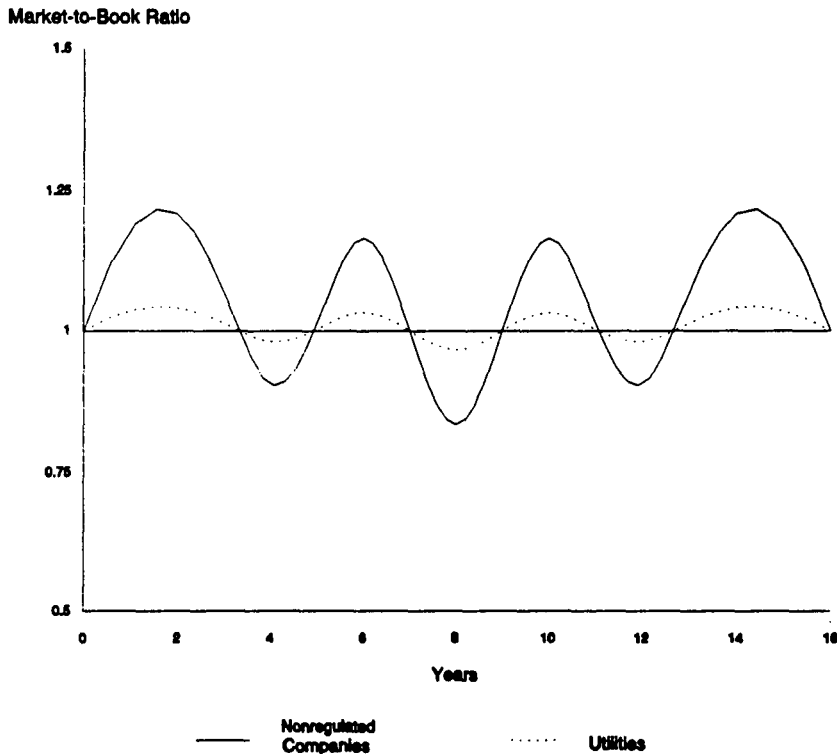
The theory and the assumption have not fared well in the crucible of reality. *Actual* market-to-book ratios over the past thirty years differ greatly from those assumed by DCF theorists:

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62. *See, e.g.,* A. KOLBE ET AL., *supra* note 8, at 30-33.
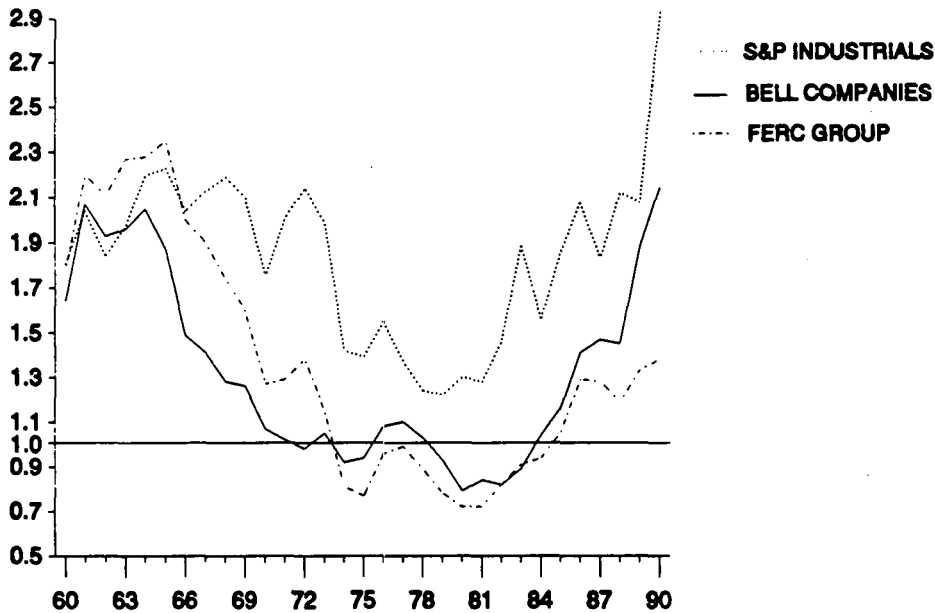
CHART C-2

Actual Market
To Book Ratios

Chart C-2 explores the notion that maintaining a market price equal to book value protects utility shareholders against the ravages that beset nonregulated companies' stock prices during bad economic times. Contrary to theory, the nonregulated companies group has never traded below book value in the postwar period. Electric utilities, on the other hand, traded below book value in eleven of the last twenty years, that is, during the "DCF era." Telephone utilities traded below book in eight of the last twenty years. Moreover, electric and telephone utilities have consistently traded at less favorable market-to-book ratios than nonregulated companies since the mid-1960s.

DCF, in short, has not provided a safety net. Rather, it has proven to be a tether that restrains utilities from achieving results available to nonregulated companies with comparable risks. That restraint conflicts with the basic premise that "[r]ate regulation . . . is intended to achieve the results which under 'normal' conditions would have been available with free, fair and normal competition."[63]

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63. Leventhal, *supra* note 4, at 990; *see also Report of the Committee on the Progress in Public Utility Regulation*, 53 NARUC 369 (1942) ("The purpose of [rate of return regulation] . . . is to stimulate and substitute the effects of competition and give the consumer the benefits which would be derived from a system of competition."); Pond, *The Law Governing the Fixing of Public Utility Rates: A Response to Recent*

2. The "Monopoly Profit" Theory

DCF theorists also claim that a market price above book value evidences monopoly profits or, at the very least, investor-expectations that the company's earnings will exceed its cost of capital.[64] If that theory were valid, it would mean that most large nonregulated companies have been earning monopoly profits for extended periods. Every year since at least 1960, the average S&P Industrial has traded significantly above book value despite recessions, including the worst post-war recession. See Chart C-2. In both 1989 and 1990, more than 75% of the S&P Industrials traded above book value.

Does anyone—other than the DCF theorist—truly believe that three-quarters of the S&P Industrials are continually earning monopoly profits? That IBM's current $99 share price (July 10, 1991) reflects investor expectations of monopoly profits in light of IBM's $68.45 per share book value? The reality is that no correlation exists between current market-to-book ratios and whether a company is or is not currently recovering its cost of capital.

Recognizing this, DCF theorists offer an explanation: The current above book market price reflects a combination of past overearnings and anticipated earnings.[65] Such temporizing, even if true, fails to justify driving the current market price of a utility's stock to book value. Indeed, the use of a formula purposefully designed to achieve that objective faces two insurmountable legal obstacles. First, a return designed to decrease shareholder value obviously cannot satisfy the current investor's return requirements. No rational investor buys shares at a price above book value expecting the value of those shares to decline. Yet, this is precisely what the DCF methodology implicitly assumes when a utility's stock trades above book value. Second, if current market prices truly are, in part, the product of past overearnings, the adoption of a formula designed to drive the market price down to book value would result in shareholders having to forfeit earnings realized in prior years. That would violate the rule against retroactive ratemaking since "[t]he law does not require the company to give up for the benefit of future subscribers any part of its accumulations from past operations."[66] A ratemaking agency, quite simply, may not lawfully set a return designed to reduce the value of the utility's stock.

Judicial and Academic Misconceptions, 41 ADMIN. L. REV. 1, 24 (1989) ("[T]he protection of consumers may not be carried to the point where they are in a better economic position than the customers of competitive companies. That would . . . be inconsistent with the legislative purpose of utility regulation. . . ."); R. MORIN, *supra* note 7, at 4 ("[T]he purpose of regulation is to duplicate the results that the competitive market system would achieve in the way of reasonable prices and profits.").

64. *See, e.g.,* A. KOLBE ET AL., *supra* note 8, at 25, 30-31; Miller Testimony, *supra* note 55, at 40-41; *FCC Rate of Return Prescription Proceeding, supra* note 18, at 7520 ¶ 115; *cf. FERC Final Generic Rule, supra* note 16, at 30.

65. *See, e.g.,* Kosh, *supra* note 10; Miller Testimony, *supra* note 55, at 40-41.

66. Board of Pub. Util. Comm'rs v. New York Tel. Co., 271 U.S. 23, 32 (1926); *see also* Public Util. Comm'n of Cal. v. FERC, 894 F.2d 1372, 1382-83 (D.C. Cir. 1990); Washington Gas Light Co. v. Baker, 188 F.2d 11, 21 (D.C. Cir. 1950) ("[P]ast excessive earnings belong to the utility just as past losses must be borne by it."), *cert. denied*, 340 U.S. 952 (1951).

3. The Theoretical Problem with a Formula Designed to Maintain Market Price Equal to Book Value

Even at the theoretical level, a problem exists with constantly forcing the market price of a utility stock to its book value. The convention of maintaining, or attempting to maintain, a one-to-one ratio transmogrifies equity into a quasi-bond—a non-redeemable security with a variable interest rate so that its market price always equals the principal. Dr. Ezra Solomon pointed out that "if regulation were to maintain" a market price equal to book value, it would transform the utility's stock into a "peculiar hybrid form of security which is neither contractual debt nor equity; it can best be described as a perpetual low-grade subordinated debenture which offers neither upside price potential nor any guarantee of dividend or capital recoupment. . . ."[67]

Similarly, Professor Bonbright characterized a regulatory practice of holding a utility's market price to book value as "harmful" and "uneconomic."[68] He pointed out that the "estimate of the current cost of common-stock capital is seldom accepted as a full measure of a fair rate of return" on equity:

> It follows that the common stocks of public utilities which actually succeed in earning a "fair rate of return" as derived by a cost-of-capital technique can be expected to command substantial premiums over their book values or rate-base values except in periods of a seriously depressed stock market. . . .[69]

No statute authorizes a ratemaking commission to strip utility stock of a basic equity feature. To the contrary, *Hope* and its recent progeny uphold the constitutional requirement that a commission must allow a utility's equity to perform like equity.[70]

Moreover, setting a return to maintain market price at book value keeps the utility at the edge of confiscation. Every time it raises new equity capital, the utility will lapse into a confiscatory situation in which it will have to dilute existing shareholder investment to raise new equity capital because flotation costs will mean that the net proceeds will be less than the book value of the current shares.[71] Thus, when a utility's stock always trades at book value, the

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67. C. PHILLIPS, JR., *supra* note 8, at 357 n.97 (quoting E. Solomon, Comments on Commission's Proposed Statement of Policy, FPC No. RM77-1 at 17 (Mimeo Feb. 1977)).

68. J. BONBRIGHT, *supra* note 8, at 255.

69. *Id.*

70. *See, e.g.,* Farmers Union Cent. Exch., Inc. v. FERC, 734 F.2d 1486, 1515, 1522-23 (D.C. Cir.), *cert. denied sub nom.*, Association of Oil Pipe Lines v. Farmers Union Cent. Exch., Inc., 469 U.S. 1034 (1984).

71. "If new stock yields net proceeds less than book value, the equity of existing stockholders is diluted; and forced *dilution is confiscation. . . .*" New England Tel. & Tel. Co. v. Department of Pub. Util., 354 N.E.2d 860, 867 (Mass. 1976) (emphasis added); *see also* Williams v. WMATC, 415 F.2d 922, 969-70 n.292 (D.C. Cir. 1968), *cert. denied sub nom.*, D.C. Transit Sys., Inc. v. Williams, 393 U.S. 1081 (1969); *see* Foster, *supra* note 29, at 919.

Issuance of new shares produces two types of flotation costs: *Selling costs* are the tangible costs that a carrier incurs in issuing new stock. They include the cost of legal and accounting work, registration fees, underwriting commissions, printing, advertising, and taxes involved in issuing securities. Thus, even if the public pays a market rate equal to book value, the net proceeds to the carrier due to selling costs would be less than book value. *Market pressure* is an intangible cost which occurs because the offering of a substantial quantity of new stock puts downward pressure on the market prices.

utility cannot attract capital on reasonable terms.[72]

The bottom line is that the theoretical justification for maintaining a one-to-one market-to-book ratio evaporates when exposed to reality. Financially sound nonregulated companies do not trade below book value or even at book value. No market place pressure tends to drive market price toward book value. Nonregulated companies trading above book value are not earning monopoly profits. Consequently, a regulatory scheme that attempts to drive the market price of utility shares to book value frustrates the purpose of regulation—to replicate what would occur if the regulated service were offered under competitive conditions.[73]

III. DCF, THE END RESULT DOCTRINE, AND THE REASONED DECISION STANDARD

Section II looked at DCF isolated from the complete formula for establishing a utility's revenue requirements.[74] Section III assumes the validity of the DCF methodology—DCF always captures the investor-required return—and examines the reasonableness of using DCF to establish a utility's revenue requirements in a "net original cost" jurisdiction. Examination of the lawfulness of using DCF in the context of the revenue requirements formula involves two doctrines, the "end result" doctrine and the "reasoned decisionmaking" standard.

The End Result Doctrine: In determining a reasonable return on equity, ratemaking agencies are fond of observing that they need not use any particular methodology or formula.[75] As *Hope* holds, it is the reasonableness of the end result, not the formula used to arrive at that result, that is relevant.[76] What the agencies conveniently forget when they rely on the "end result"

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72. DCF theorists who are purists try to circumvent this problem by unrealistically assuming that all new equity is generated internally, that is, with no outside financing. *See* R. MORIN, *supra* note 7, at 86. More practical DCF advocates would recognize that utilities do need to generate new capital from external sources and would allow earnings that permit the utility's stock to trade slightly (generally 5%) above book value. *See* R. MORIN, *supra* note 7, at 102-105; *cf.* A. KOLBE ET AL., *supra* note 8, at 25.

73. *See supra* note 63. Professor Kahn points out that a rate of return must be set high enough "[to] fulfill . . . an *institutional* function: it somehow must provide the incentives to private management that competition and profit-maximization are supposed to provide in the nonregulated private economy generally." I A. KAHN, *supra* note 8, at 44.

74. In its simplest form, a utility's revenue requirement (RR) is determined by multiplying rate base (I) times return (r) plus operating costs (OC), taxes (T), and depreciation (D): $RR = (I \times r) + OC + T + D$. *See* Boston Edison Co. v. FERC, 885 F.2d 962, 964-65 (1st Cir. 1989); Illinois Bell Tel. Co. v. FCC, 911 F.2d 776, 778-79 (D.C. Cir. 1990).

The determination of a reasonable overall return requires the Commission to determine the cost of each class of investor-supplied capital (security) issued by the utility. The determination for each essential element of the rate prescription must be supported by substantial evidence. Permian Basin Area Rate Cases, 390 U.S. 747, 791-92 (1968). The end result, the overall return, will not be reasonable unless the return to each class of security—debt, preferred, and common equity—is reasonable. *Williams*, 415 F.2d at 936 n.69.

75. *See* Generic Determination of Rate of Return on Common Equity for Public Utilities, 38 F.E.R.C. ¶ 61,160, at 61,441; *FCC 1990 Rate of Return Prescription Proceeding, supra* note 18, at 7520 ¶ 113; American Tel. & Tel. Co. and the Associated Bell Sys. Cos.—Charges for Interstate and Foreign Communication Service, 9 F.C.C.2d 30, 55 ¶ 82 (1967).

76. FPC v. Hope Natural Gas Co., 320 U.S. 591, 602 (1944).

doctrine is that *Hope* also established the standard for evaluating the reasonableness of the end result regardless of what methodology is employed.[77] The evidence must show that the equity return authorized by the agency will enable the carrier to (a) attract additional equity capital on reasonable terms, and (b) realize a return on equity comparable to other enterprises with comparable risks.[78]

The Reasoned Decision Standard: Apart from the end result, the courts also require that agency rate decisions be reasoned. At a minimum, each of the essential elements of the decision must be supported by evidence:

> FERC's determinations regarding rates of return, definitions of rate bases, and other technical aspects of ratemaking are entitled to considerable deference. . . . Nevertheless, [the court's] review must ensure that "each of the order's essential elements is supported by substantial evidence" . . . and "reached by reasoned decisionmaking—that is, a process demonstrating the connection between the facts found and the choice made."[79]

While courts will defer to an agency's expertise, ratemaking agencies are not expert in all that they do.[80] Moreover, even where expertise exists, such "expertise cannot be used as a cloak for fiat judgments."[81] The agency must provide a reasoned explanation of how it arrived at its conclusions, and why it rejected contrary positions. The agency cannot simply declare that, based on its expert judgment, it finds an argument unpersuasive.[82]

The next two subsections explore the use of DCF in a net original cost jurisdiction from the "end result" and "reasoned decision" perspectives. That examination indicates that even assuming the validity of the EMH, DCF results under current conditions depart from the reasoned decision standard and fail to satisfy *Bluefield-Hope*'s capital attraction and comparable earnings standards.

A. Application of a DCF Market-Required Return to a Net Original Cost Rate Base

The DCF methodology presumes to produce the "market required" return on equity, that is, the "cost of equity" on the *market value*—not the

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77. *See* Duquesne Light Co. v. Barasch, 488 U.S. 299, 314-16 (1989). In other words, the end result doctrine does not "collapse in practice into a standardless exercise of Commission discretion resting on no more than an assertion of 'expertise.' " Tennessee Gas Pipeline Co. v. FERC, 926 F.2d 1206, 1209 (D.C. Cir. 1991) (citations omitted); *see also* Colorado Interstate Gas Co. v. FPC, 324 U.S. 581, 605 (1945). Simply because "a particular ratemaking standard is generally permissible does not per se legitimate the end result of the rate orders it produces." Jersey Cent. Power & Light Co. v. FERC, 810 F.2d 1168, 1180 (D.C. Cir. 1987) (*en banc*).

78. *Hope*, 320 U.S. at 603; *see also* Bluefield Waterworks & Improvement Co. v. Public Serv. Comm'n of West Virginia, 262 U.S. 679, 692-93 (1923).

79. Public Serv. Comm'n of N.Y. v. FERC, 813 F.2d 448, 451 (D.C. Cir. 1987) (citations omitted); *see also* Illinois Bell Tel. Co. v. FCC, 911 F.2d 776 (D.C. Cir. 1990).

80. *See, e.g., Tennessee Gas Pipeline Co.*, 926 F.2d at 1211 ("The Commission's expertise lies not in financial theory itself, but in the application of the teachings of financial and economic theory to the setting of rates for regulated utilities.").

81. *Id.*; *see also* Union Elec. Co. v. FERC, 890 F.2d 1193, 1202-03 (D.C. Cir. 1989).

82. *See* Moraine Pipeline Co. v. FERC, 906 F.2d 5, 9 (D.C. Cir. 1990).

book value—of a company's stock.[83] Unless the market price of a utility's stock equals its book value, the unmodified application of the market-oriented DCF results to a net original cost (book value) rate base understates the earnings necessary to satisfy the investor-required (expected) return. Not only does the unmodified application of DCF results significantly understate the investor-expected return, it leads to contradictory results.

In *Farmers Union Central Exchange, Inc. v. FERC*,[84] (*Farmers Union II*), the D.C. Circuit held that an agency's rate-of-return formula must be methodologically consistent with its rate base development. Otherwise, the result will be arbitrary and, therefore, unlawful since "[T]he ratemaking agency has a duty to ensure that the method of selecting the appropriate rate of return [is] reasonably related to the method of calculating the rate base."[85] When the two methods are not consistent, "the combination of [the] rate base and rate of return methodologies does not produce an acceptable 'end result.' "[86]

In that case, the FERC had based its rate of return determination on what comparable risk companies earned on their book equity. The Commission then applied that return to a valuation (that is, market value) rate base. As the valuation rate base was greater than book value (net original cost), the court held that adopting a return based on book value returns was inconsistent and, in that case, overstated the pipeline carrier's revenue requirements.

It is, of course, just as inconsistent (and thus no less erroneous) to apply a market-required return to a book value rate base. A simple example will illustrate why. Assume a utility's shares have a book value of $40 and that investors expect a 5% growth and a $3 dividend. If investors require a 10% return, they will bid the utility's stock price to $60 even though the book value of the stock is $40.[87] Accordingly, a DCF analysis will show (at least in theory) an investor required return of 10%:

$$K_e = \frac{\$3}{\$60} + 5\% = 10\%.$$

Further assume that comparable risk companies are earning 15% on book value. Investors obviously expect to realize $6 in earnings. The 10% market-required return times the $60 market value rate base equals $6. The 15% "book value" return times the $40 book value equals $6.

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83. *See Tennessee Gas Pipeline Co.*, 926 F.2d at 1211-12; Montaup Elec. Co., 38 F.E.R.C. ¶ 61,252, at 61,866 (1987); *FERC Final Generic Rule, supra* note 16, at 29; *FCC 1990 Rate of Return Prescription Proceeding, supra* note 18, at 7521 ¶ 118.

84. 734 F.2d 1486 (D.C. Cir. 1984).

85. *Id.* at 1527 (citations omitted).

86. *Id.*

87. Thus, the DCF methodology postulates that market price (P) equals the expected dividend divided by the investor-required return less anticipated growth:

$$P = \frac{D}{K - g}$$

Reformulated, the indicated investor-required return can be determined using the "classic" DCF formula:

$$K_e = \frac{D}{P} + g.$$

See J. FRANCIS, *supra* note 27, at 471.

In *Farmers Union II*, the court condemned (using the numbers in the example) adopting a 15% "book value" return and applying that return to the $60 "market value" rate base. Investors would earn, not the expected $6, but $9.00 ($60 × 15%). That earnings level would equate to an 22.5% (not 15%) return on book value[88] and a 15.0% (not 10%) return on market value.[89] The D.C. Circuit Court condemned that methodological inconsistency as tipping the ratepayer-investor balance too far in favor of the investor.[90]

The balance tips too far the other way in the FERC's application of DCF in electric rate proceedings and the FCC's application in telephone proceedings. Both agencies apply the *market-required* return to a book value (net original cost) rate base which reflects equity at book value even when the utility's stock is trading above book value. In the example, investors expect $6 in earnings on a share of utility A's stock. Applying the 10% market-required return to the $40 book value rate base (*i.e.*, the equity portion of the depreciated original cost rate base) leaves investors $2 short: The 10% return times the $40 book value equals only $4, not the investor-required $6. The result is investors receive a 6.67% market return, not the DCF-indicated 10% market return.

TABLE I

EXPECTED v. ALLOWED RETURN

	EXPECTED		ALLOWED	
Return	$6.00	($60 × 10%)	$4.00	($40 BV × 10%)
Dividends	$3.00	($60 × 5%)	$3.00	
Growth	$3.00	($60 × 5%)	$1.00	($4.00 − $3.00)
Return	10.0%	($6.00 ÷ $60)	6.67%	($4.00 ÷ $60)

Not only is the application of a market-required return to a book value rate base methodologically inconsistent, the results make the DCF formula self-contradictory. This can be seen by returning to the example which assumes, again, a 5% dividend yield ($3 ÷ $60) and a 5% growth rate. Applying the 10% return to Utility A's net original cost rate base results in earnings per share of $4 ($40 × 10%). After paying its $3 dividend, the firm has $1 left for growth. That $1 translates into a 1.67% growth rate ($1.00 ÷ $60 = 1.67%), not the 5% growth rate reflected in the DCF formula to arrive at the 10% return.[91] Thus, the self-contradiction is readily apparent: 1.67% does not equal 5%. Self-contradictory results flunk the reasoned decisionmaking test.

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88. $9.00 ÷ 40 = 22.5%.

89. $9.00 ÷ 60 = 15.0%.

90.   734 F.2d at 1525-27. Inherent in the ratemaking process is a "balancing of the investor and the consumer interests." FPC v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944). In balancing those interests, the courts have stressed that rates which are too low "may impede the provision of adequate service . . . ." American Tel. & Tel. Co. v. FCC, 487 F.2d 865, 874 (2d Cir. 1973). The Supreme Court has held that in regulating utilities, Congress was "manifesting its concern for the legitimate interests of . . . companies in whose financial stability the gas-consuming public has a vital stake." United Gas Pipeline Co. v. Memphis Light, Gas & Water Div., 358 U.S. 103, 113 (1958).

91.   The actual growth rate can be calculated applying the following formula:

B.   DCF and the Bluefield-Hope *Standards*

Despite death notices by some academics, the two-part *Bluefield-Hope* standard remains legally robust as the Supreme Court made clear in *Duquesne Light*.[92] The "end result" of an agency rate order must satisfy both the (1) attraction of capital standard and (2) the comparable earnings standard:

> [Hope] provide[s] two standards for determining a fair rate of return: The first is the "comparable earnings" standard—that the commission provide a return commensurate with returns on other investments attended by corresponding risks. The second is the "attraction of capital" standard—that the return to the company must be sufficient to attract capital to the enterprise.[93]

The "classic" DCF model, under current circumstances, fails both standards.

1.   *Bluefield-Hope's* Attraction-of-Capital Standard

DCF advocates imply that shareholders who purchased their shares at a price above book value are the beneficiaries of monopoly profits.[94] As a remedy, DCF advocates would divest those shareholders of all amounts above book value by applying DCF's market-required return to a net original cost rate base which would drive the market price toward book value.[95] That action cannot be squared with the attraction-of-capital standard.

Hope holds that the equity return must be sufficient to "assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital" on reasonable terms.[96] Inherent in this standard is the notion that there must be fairness to existing capital, including those shareholders who bought their stock at prices in excess of book value:

> To maintain a properly defined financial integrity, the regulatory objective should be to permit values of the common stocks of regulated companies to have some reasonable relation to values of the stocks of unregulated companies. Stated differently, the earnings of utilities should be sufficiently high to achieve market-to-book ratios which are consistent with those prevailing for stocks of unregulated companies.[97]

Justice Brandeis observed that "an inflow of capital can only be assured by treatment of capital already invested which will invite and encourage further investment."[98]

Reducing shareholder value precipitously, or adopting a ratemaking

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$$Gi = Ke - Y(M/B)$$

Gi = Implied Growth Rate
Y = Dividend Yield (D/P)
Ke = DCF indicated return
M/B = Market-to-book ratio

Applied to example:

$$Gi = 10\% - 5\% (\$60 \div \$40) = 1.67\%$$

92.   Duquesne Light Co. v. Barasch, 488 U.S. 591, 310-15 (1989).

93.   Leventhal, *supra* note 4, at 992.

94.   *See, e.g.,* Miller Testimony, *supra* note 55, at 39-40.

95.   *See* R. MORIN, *supra* note 7, at 241; A. KOLBE ET AL., *supra* note 8, at 25-33; *see also, FCC 1990 Rate of Return Prescription Proceeding, supra* note 18, at 7520-21 ¶ 117.

96.   FPC v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944).

97.   Foster, *supra* note 29, at 919.

98.   St. Louis & O'Fallon Ry. v. United States, 279 U.S. 461, 502 (1929) (Brandeis, J., dissenting); *see*

formula purposefully designed to achieve that result, is decidedly not assuring the financial integrity of the utility.[99] Consequently, under current conditions a DCF-indicated return fails to satisfy the capital attraction standard.

2. *Bluefield-Hope's* Comparable Earnings Standard

In *Williams v. Washington Metropolitan Area Transit Commission,*[100] the D.C. Circuit reversed a commission's rate-of-return finding because of the "absence of any inquiry into the appropriateness of the returns being afforded [the carrier's] shareholders in the light of returns being earned by other companies of comparable risk."[101] The Court condemned this omission as arbitrary and as a misapplication of governing standards.[102] The Court "strongly admonish[ed] that a comparison of the returns being afforded [the carrier's] shareholders with those of other companies of corresponding risk is *necessary to a responsible determination* of the proper margin of return which [the carrier] should be allowed."[103]

The DCF formula provides no information about the earned returns on investments in other enterprises having corresponding risks. The DCF approach is inwardly directed; that is, the inputs to the formula involve only data for the company being analyzed. The output of the formula, consequently, provides no information about the realized earnings of other companies with similar risks.

Nevertheless, DCF proponents claim that the DCF methodology does satisfy the comparable earnings standard. Their argument proceeds along the following lines: Investors surveying the market have concluded (based on a DCF analysis) that, given all the other investment alternatives, they require (for example) a 10% return on Utility A's equity. That is the "opportunity cost" of Utility A's equity capital *vis-a-vis* all the other investment opportunities in the market. That, in effect, is what comparable earnings is all about. Thus, the argument continues, DCF satisfies *Bluefield-Hope's* comparable earnings standard.

The theory is sound *if*—and these are big ifs—the EMH theory is valid and the utility's stock is trading at book value. Putting the validity of the EMH aside, the problem is that utilities are not trading at book value, and the DCF "comparison" returns are market-required returns, not book-required returns. If investors bid the market price to achieve a 10% (expected) return, that 10% return provides no information on what comparable risk companies

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also Foster, *supra* note 29, at 886-87; I A.J.G. PRIEST, PRINCIPLES OF PUBLIC UTILITY REGULATION 199-200 (1969).

99. In the *FCC 1990 Rate of Return Prescription Proceeding,* the evidence showed that if the market value of the Bell stocks fell to book value, the loss to existing Bell shareholders would be approximately $78 billion. Rebuttal Testimony of Charles F. Phillips, Jr., on behalf of the Ameritech Operating Companies, at 4 & Attachment 1, FCC, CC Docket No. 89-624 (referenced in 5 F.C.C. Rcd 7507 (1990)) [hereinafter Phillips Rebuttal Testimony].

100. 415 F.2d 922 (D.C. Cir. 1968).

101. *Id.* at 937.

102. *Id.* at 939 n.86.

103. *Id.* at 933-34 (emphasis supplied).

are earning on their *book* value—the value to which the DCF-indicated return will be applied in practice.

Returning to the example (Utility A is trading at $60 and has, applying the DCF formula, a market required return of 10%), investors would expect to realize $6 in dividends and growth ($60 × 10% = $6). Where investors have bid the *market* prices of other firms' shares to a level that will yield a 10% return, comparability arguably exists between Utility A and those firms. Thus, if investors anticipate that S&P Company's next-period dividend and growth will equal $10 and they require a 10% return, investors will bid S&P Company's stock to a $100 market price—whether the book value of an S&P Company share is $50 or $10 or $200. While the 10% market-required return for the utility and S&P Company might indicate that they are comparable risk companies, the 10% market-required return provides no useful information about the proper return on the utility's depreciated original cost rate base or S&P Company's book value. Would S&P Company's investors—who earned 20% on book equity last year—now be satisfied with a 10% return on book equity; that is, $5 ($50 × 10%) compared to $10 ($100 × 10%)? The answer is obvious.

So long as ratemaking agencies continue to use a net original cost rate base, the DCF methodology cannot satisfy the comparable earnings standard. DCF results are unrelated to what "comparable risk" companies are earning on their book equity. Consequently, the problems with DCF come full circle: It is methodologically inconsistent to compute a utility's net revenue requirement applying a market-required return to a net original cost rate base. Such inconsistency "does not produce an acceptable 'end result.' "[104]

IV. THE COMPARABLE EARNINGS APPROACH IN PERSPECTIVE

Reintroducing comparable earnings into the ratemaking process is long overdue,[105] particularly since the core assumptions of the DCF methodology have eroded. Identifying "comparable risk" companies will serve as grist for disputes among experts; nevertheless, the fundamental premises of comparable earnings studies accord with the use of a net original cost rate base and *Bluefield-Hope*—a claim that cannot be made for the DCF methodology.

A. The Outline of a Comparable Earnings Methodology

In the old days selecting comparable risk companies involved intuition and guesswork by experts. Today, risk analysis has become sophisticated and refined. Various financial advice publications, such as *Value Line*, evaluate the risks of individual companies from several perspectives. These evaluations are significant not because they are "right" but because investors rely on them. The relevant risk after all is not the "actual" risk, but the investor-perceived

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104. Farmer's Union II, *supra* note 11, at 1527.

105. D.C. Circuit Court Judge Stephen Williams, in a recent article, characterized comparable earnings as that "now-rare . . . method for estimating cost of capital . . . ." Williams, *Fixing the Rate of Return After Duquesne*, 8 YALE J. REG. 159 (1991).

risk, particularly the perceived comparability or differences in risks among available investment choices.

A comparable earnings study, thus might identify nonregulated companies having betas, safety ratings, stock rankings and other risk measures relied on by investors[106] that are similar to those of the regulated utility or utility group.[107] The actual book returns for those nonregulated companies would provide evidence of what comparable risk companies have actually earned in recent years.

In the *FCC 1990 Rate of Return Prescription Proceeding*, Dr. Phillips, author of *The Regulation of Public Utilities*, introduced a comparable earnings study designed to capture the book equity returns of nonregulated companies with risks similar to the jurisdictional services provided by Bell companies.[108] In the FERC Generic Rate of Return Proceeding, the author of this article outlined a comparable earnings formula similar to Dr. Phillips's approach, but with a twist.[109]

Dr. Phillips's Comparable Earnings Study: Dr. Phillips's first step was to identify reasonable risk parameters associated with the provision of interstate access service (the jurisdictional services) by the Bell companies. (The Bell companies could not be used because they are wholly owned by holding companies which had diversified into numerous nonregulated activities.) Dr. Phillips determined that the largest "pure telephone" companies (non-Bell) provided a sound surrogate for the investment risks associated with the Bell companies' provision of interstate access. To capture the investor-perceived risks of those companies, Dr. Phillips identified their betas, safety ratings and bond ratings. Using the stocks listed on the New York Stock Exchange, Dr. Phillips identified all the nonregulated companies with risk parameters falling within the range established in the previous step.[110]

Next, Dr. Phillips determined the equity returns for those companies identified as having comparable investor-perceived risks. Using the most recent five years of data available at the time (1984-1988), Dr. Phillips found that the comparable risk companies' annual returns on book equity ranged from 15.5% to 20.9%, with the 5-year average being 18.2%. Dr. Phillips then performed various tests that confirmed the representative nature of the 1984-1988 period results.[111]

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106. Dr. Phillips sets out many of the various risk measures that have been relied on over the years in his text. CHARLES F. PHILLIPS, JR. *supra* note 8, at 354-65 (1984).

107. The comparable earnings standard does not envision a comparison to other regulated enterprises. Such a limitation would be circular and contrary to established standards. Leventhal, *supra* note 4, at 999-1002; Pond, *The Treatment of Basic Principles of Rate Regulation in the FCC's Interim Decision in the Bell System Interstate Rate Case*, 1968 A.B.A. SEC. PUB. UTIL. LAW REP. 38, 45-47. Moreover, sound reasons exist for a comparison with unregulated enterprises. The most compelling is that regulated carriers must compete in the unregulated capital markets against nonregulated enterprises for the limited amount of available investor-supplied capital.

108. Prepared Testimony of Charles F. Phillips, Jr., on behalf of the Ameritech Operating Companies, FCC, CC Docket No. 89-624 (referenced in 5 F.C.C. Rcd. 7507 (1990)) [hereinafter Phillips Testimony].

109. *See FERC Final Generic Rule, supra* note 16, 52 Fed. Reg. at 30; *FERC Generic Rehearing Order, supra* note 16, at 61,441-42.

110. Phillips Testimony, *supra* note 107, at 6; Phillips Rebuttal Testimony, *supra* note 99, at 18-19.

111. *See* Phillips Rebuttal Testimony, *supra* note 99, at 21-22 & Attachment 6.

The Proposal in the FERC Proceeding: Similar to the Phillips approach, the comparable earnings approach proposed to the FERC involved using various "risk" screens (betas, stock rankings and bond ratings). Instead of using actual factors/ratings for electric utilities, objective criteria were used. The justification for using objective standards was to assure satisfaction of the second prong of the *Bluefield-Hope* standard, the attraction of capital standard (At the time, electrics were in financial doldrums and a comparison to the earnings of other financially limp companies would not have served the long range public interest). After identifying the risk parameters for electrics, nonregulated companies with those characteristics were identified. The book equity returns of those companies, averaged over five years, served as the comparable earnings guide for the fair equity return.

B.   The Criticisms of the Comparable Earnings Approach

The FERC dismissed the comparable earnings evidence as a "depart[ure] from a cost of capital standard."[112] The FCC dismissed comparable earnings evidence in its *1990 Rate of Return Prescription Proceeding* simply on the basis that Dr. Phillips's numbers were too high, and thus his study must be flawed.[113]

Even though the agencies failed to address the proposals head-on, several rebuttal witnesses had offered various criticisms of the comparable earnings studies. Not surprisingly, the rebuttal witnesses challenged the specific criteria used to identify nonregulated companies with comparable risks. Entering that fray is beyond the scope of this paper. Others, however, offered more generic criticisms which are analyzed in the next three subsections.

1.   Comparable Earnings and Risk-Return Principles

A recurring argument was that the comparable earnings studies produced results that are inconsistent with risk-return principles. Low risk companies tend to earn higher returns on book equity than high risk companies. Thus, DCF theorists claim, the comparable earnings approach "violates risk-return" principles and should not be used by ratemaking agencies.[114]

That claim fails to distinguish between market returns and "accounting" returns (*i.e.*, returns on book equity). The risk-return relationship apparent in securities markets is *not* between accounting rates of return on book equity and risk, but between risk and market rates of return.[115] There are no "risk/required return principles" that relate accounting (book) returns on common

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112. *FERC Final Generic Rule, supra* note 16, 52 Fed. Reg. at 30.

113. *FCC 1990 Rate of Return Prescription Proceeding, supra* note 18, at 7526 ¶ 163.

114. *See, e.g.,* A. KOLBE, *supra* note 8, at 46-47; Miller Testimony, *supra* note 55, at 39; Prepared Testimony of Steven F. Clinger on behalf of Florida's Citizens, at 7-8, FCC, CC Docket No. 89-624 (referenced in 5 F.C.C. Rcd. 7507 (1990)); *cf. FERC Generic Rehearing Order, supra* note 16, at 61,441-42; *FERC Final Generic Rule, supra* note 16, 52 Fed. Reg. at 29.

115. *Cf. FERC Generic Rehearing Order, supra* note 16, at 61,441 ("[U]nlike the relationship between risk and market required rates of return, the relationship between risk and accounting rates of return is not clear. In other words, companies with high risk don't necessarily earn high book returns, and vice versa for companies with low risk.").

equity. Consequently, comparable earnings cannot violate risk/required return principles.

2. The Inability to Purchase Stock at Book Value

Some DCF advocates oppose the comparable earnings approach on the ground that investors cannot acquire any comparison company's equity at book value, and hence cannot realize a 15% return on their equity. There are three problems with this criticism.

First, the ratemaking agency is not attempting to determine the return to be applied to the market value of the utility's stock. It is attempting to determine a return that is applicable to a net original cost (book value) rate base.

Second, while it is true that investors cannot acquire the comparable companies' equities at book value, it is also true that investors cannot acquire the utility's stock at book value.[116] But, so long as the Commission applies the authorized return to a net original cost rate base, *Bluefield-Hope* and consistency require the Commission to compare returns on book equity, and not market returns.

Third, the utility is not asking to earn a market return of 15%. It is asking the opportunity to earn a 15% return on book equity (rate base) to allow its investors to earn their market-required return under current conditions.

3. The DCF Theorists' Version of a Comparable Earnings Study

Some DCF advocates claim to present comparable earnings studies when they offer DCF-results for a series of nonregulated companies.[117] One DCF witness in the *FCC 1990 Rate of Return Prescription Proceeding*, for example, identified what he believed were comparable risk companies and then offered DCF results for those companies as indicating the required return for local telephone companies.[118] Table II contrasts the DCF-derived equity returns for that witness' comparable companies and the actual return on book equity realized by those companies:

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116. *See, e.g.,* Miller Testimony, *supra* note 55, at 40-41.

117. *See, e.g.,* Miller Testimony, *supra* note 55, at 40.

118. Prepared Testimony of Christopher C. Klein on behalf of the Tennessee Public Service Commission, at 28 & Exhibit 3, FCC, CC Docket No. 89-624 (referenced in 5 F.C.C. Rcd. 7507 (1990)).

TABLE II

Comparable Risk Companies	DCF-Indicated Returns	Returns on Book Equity 1984-1988
American Home Products Corp.	15.0%	33.2%
Amoco Corp.	12.7	13.6
Atlantic Richfield Co.	12.5	14.9
Chevron Corp.	13.3	8.7
Coca-Cola Co.	18.1	26.9
Eastman Kodak Co.	14.9	12.8
Exxon Corp.	12.9	16.8
General Motors Corp.	13.1	13.9
Intl Business Machines Corp.	15.1	18.4
Merck & Co.	20.6	30.8
Mobil Corp.	13.5	9.3
Procter & Gamble Co.	14.5	13.1
Average	**14.7%**	**17.7%**

Those comparable risk companies earned, on average, a 17.7% on book equity, not the 14.7% DCF indicated return.[119]

The logic of discarding the actual returns on equity for the market-required return is a mystery. But it is a mystery easily dismissed. *Bluefield-Hope* requires that the Commission look at actual earnings, not some reformulation of those earnings.[120] The comparison companies' "market-indicated" returns are not legally relevant when the authorized return will be applied to a net original cost rate base.

V.   CONCLUSION

Hope springs eternal. The time will come when utilities will wake up to the depressing effect of the DCF methodology, and when courts will no longer allow ratemaking agencies to pretend that the DCF methodology satisfies the *Bluefield-Hope* standards. DCF results provide no information that permits reviewing courts to judge whether the end result of the ratemaking process allows the utility to attract new capital on reasonable terms or provides investors a return equal to that realized by nonregulated companies with corresponding risks.

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119.   The 17.7% average actual book equity return is on the high side of the 15.5%-18.0% equity return range recommended by Dr. Phillips based on his comparable earning study. *See* text accompanying note 106, above. A former Merrill Lynch bi-monthly publication, *Quantitative Analysis*, provided expected market return estimates and expected book returns on common equity over five years for utilities. Expected book returns on common equity exceeded, on average, the expected market returns by 250 basis points. *See* Rebuttal Testimony of Charles M. Linke on behalf of the Ameritech Operating Companies, at 5, FCC, CC Docket No. 89-624 (referenced in 5 F.C.C. Rcd. 7507 (1990)).

120.   The Supreme Court in *Hope* referred to comparable earnings on book value and not on market value. Hope was a wholly-owned subsidiary of Standard Oil of New Jersey and, therefore, its stock had no independently discernible market value. FPC v. Hope Natural Gas Co., 320 U.S. 591, 594 (1944). Moreover, since *Hope*, comparable earnings witnesses traditionally have used book value; if that had been a misapplication, it certainly would have been corrected years ago.