

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Commission's own motion)
ordering **THE DETROIT EDISON COMPANY**)
to show cause why its retail rates for the sale)
and distribution of electric energy should not)
be decreased.)

Case No. U-14838

QUALIFICATIONS
AND
DIRECT TESTIMONY
OF
DR. ROGER A. MORIN

THE DETROIT EDISON COMPANY
QUALIFICATIONS OF DR. ROGER A. MORIN

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1 **Q. Please state your name, address, and occupation.**

2 A. My name is Dr. Roger A. Morin. My business address is Georgia State
3 University, Robinson College of Business, University Plaza, Atlanta,
4 Georgia, 30303. I am Professor of Finance at the College of Business,
5 Georgia State University and Professor of Finance for Regulated Industry at
6 the Center for the Study of Regulated Industry at Georgia State University. I
7 am also a principal in Utility Research International, an enterprise engaged
8 in regulatory finance and economics consulting to business and
9 government.

10

11 **Q. Please describe your educational background.**

12 A. I hold a Bachelor of Engineering degree and an MBA in Finance from
13 McGill University, Montreal, Canada. I received my Ph.D. in Finance and
14 Econometrics at the Wharton School of Finance, University of
15 Pennsylvania.

16

17 **Q. Please summarize your academic and business career.**

18 A. I have taught at the Wharton School of Finance, University of Pennsylvania,
19 Amos Tuck School of Business at Dartmouth College, Drexel University,
20 University of Montreal, McGill University, and Georgia State University. I
21 was a faculty member of Advanced Management Research International,
22 and I am currently a faculty member of The Management Exchange Inc.
23 and Exnet, Inc., where I continue to conduct frequent national executive-
24 level education seminars throughout the United States and Canada. In the

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1 last twenty five years, I have conducted numerous national seminars on
2 "Utility Finance," "Utility Cost of Capital," "Alternative Regulatory
3 Frameworks," and on "Utility Capital Allocation," which I have developed on
4 behalf of The Management Exchange Inc. and Exnet in conjunction with
5 Public Utilities Reports, Inc.

6

7 I have authored or co-authored several books, monographs, and articles in
8 academic scientific journals on the subject of finance. They have appeared
9 in a variety of journals, including The Journal of Finance, The Journal of
10 Business Administration, International Management Review, and Public
11 Utility Fortnightly. I published a widely-used treatise on regulatory finance,
12 Utilities' Cost of Capital, Public Utilities Reports, Inc., Arlington, Va. 1984.
13 In late 1994, the same publisher released Regulatory Finance, a
14 voluminous treatise on the application of finance to regulated utilities. A
15 revised and expanded edition of this book was scheduled for publication at
16 the time of this writing. I have engaged in extensive consulting activities on
17 behalf of numerous corporations, legal firms, and regulatory bodies in
18 matters of financial management and corporate litigation. Appendix A
19 describes my professional credentials in more detail.

20

21 **Q. Have you previously testified on cost of capital before utility**
22 **regulatory commissions?**

23 A. Yes, I have been a cost of capital witness before nearly fifty (50) regulatory
24 bodies in North America, including the Michigan Public Service Commission

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1 ("MPSC", or "Commission"), the Federal Energy Regulatory Commission,
2 and the Federal Communications Commission. I have also testified before
3 the following state, provincial, and other local regulatory commissions:

4

Alabama	Hawaii	Nevada	Oregon
Alaska	Illinois	New Brunswick	Pennsylvania
Alberta	Indiana	New Hampshire	Quebec
Arizona	Iowa	New Jersey	South Carolina
Arkansas	Kentucky	New York	South Dakota
British Columbia	Louisiana	Newfoundland	Tennessee
California	Manitoba	North Carolina	Texas
Colorado	Michigan	North Dakota	Utah
Delaware	Minnesota	Nova Scotia	Vermont
District of Columbia	Mississippi	Ohio	Virginia
Florida	Missouri	Oklahoma	Washington
Georgia	Montana	Ontario	West Virginia

5

6 The details of my participation in regulatory proceedings are provided in
7 Appendix A.

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THE DETROIT EDISON COMPANY
DIRECT TESTIMONY OF DR. ROGER A. MORIN

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1 **Q. What is the purpose of your testimony in this proceeding?**

2 A. The purpose of my testimony in this proceeding is to present an
3 independent appraisal of the fair and reasonable rate of return on the
4 electric utility operations of The Detroit Edison Company ("DECo," or
5 "Company") in the State of Michigan with particular emphasis on the fair
6 return on the Company's common equity capital committed to that
7 business. Based upon this appraisal, I have formed my professional
8 judgment as to a return on such capital that would: (1) be fair to the
9 ratepayer, (2) allow the Company to attract capital on reasonable terms, (3)
10 maintain the Company's financial integrity, and (4) be comparable to returns
11 offered on comparable risk investments. I will testify in this proceeding as
12 to that opinion. I have also been asked to comment on the adequacy of the
13 Company's capital structure.

14

15 **Q. Please identify the exhibits and appendices accompanying your**
16 **testimony.**

17 A. Exhibit DE-12

18 Schedule D4 Cost of Common Shareholders Equity

19 Schedule D4-1 Vertically Integrated Electric Utilities Beta Estimates

20 Schedule D4-2 Moody's Electric Utility Common Stocks Over Long-Term

21 - Treasury Bonds Annual Long-Term Risk Premium

22 Schedule D4-3 Electric Utilities Historical Growth Rates

23 Schedule D4-4 Vertically Integrated Electric Utilities

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1	Schedule D4-5	S&P's Vertically Integrated Electric Utilities - DCF
2		Analysis: Value Line Growth Projections
3	Schedule D4-6	Vertically Integrated Electric Utilities – DCF Analysis:
4		Analysts' Growth Forecasts
5	Schedule D4-7	Moody's Electric Utilities - DCF Analysis: Value Line
6		Growth Projections
7	Schedule D4-8	Moody's Electric Utilities – DCF Analysis Analysts'
8		Growth Forecasts
9	Schedule D4-9	Integrated Electric Utilities Common Equity Ratios
10	Appendix A	Resume of Roger A. Morin
11	Appendix B	CAPM and Empirical CAPM
12	Appendix C	Flotation Cost Allowance
13		
14	Q.	Were these Exhibits and Appendices prepared by you or under your
15		supervision?
16	A.	Yes, they were.
17		
18	Q.	Please summarize your findings concerning DECo's cost of common
19		equity.
20	A.	DECo's investment risk is above average compared to other electric utilities
21		in the United States primarily due to the difficult economic climate in
22		Michigan which is caused in large part by the continued decline in the
23		domestic automotive market share, and the continuing exposure DECo has
24		to the volatile customer choice load. Michigan's approach to electric

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1 restructuring is unique when compared to electric restructuring in other
2 states. Michigan is the only state to grant full customer choice, but not
3 deregulate electric utility generation. As I understand, DECo continues to
4 be obligated to provide electric supply at cost-based rates, and customers
5 are free to switch suppliers and subsequently return to DECo's regulated,
6 cost-based generation rates at any time, and for any reason to capture the
7 lower of market or cost-based prices. DECo has proposed in this
8 proceeding an electric choice tracker mechanism. Assuming DECo is
9 granted the opportunity to implement this tracker mechanism, as discussed
10 by witness Falletich, I recommend that a rate of return of 11.25% (Exhibit
11 DE-12, Schedule D4) be used for ratemaking purposes on DECo's common
12 equity capital. As I understand it, the tracker mechanism does not result in
13 automatic monthly adjustments to rates but rather institutionalizes a means
14 to more closely follow electric choice load swings, but only after certain
15 procedural preconditions and approvals are met and received. If this tracker
16 mechanism is not approved for implementation by the Commission as the
17 Company has proposed, my recommended return on equity would increase
18 by approximately 25 basis points, to 11.50%. The risks inherent in the
19 electric utility business in Metropolitan Detroit and Southeastern Michigan
20 are further supported and explained in more detail by witnesses Buckler and
21 Stadnikia.

22 My recommended return of 11.25% is derived from studies I performed
23 using the Capital Asset Pricing Model ("CAPM"), Risk Premium, and
24 Discounted Cash Flow ("DCF") methodologies. I performed two CAPM

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1 analyses, one using the traditional CAPM and another using an empirical
2 approximation of the CAPM ("ECAPM"). I performed two risk premium
3 analyses: a historical risk premium analysis on the electric utility industry
4 using Treasury bond yields and a study of the risk premiums allowed in the
5 electric utility industry. I also performed DCF analyses on three surrogates
6 for the Company. They are: DECo's parent company, DTE Energy ("DTE"),
7 a group of electric utilities that make up Moody's Electric Utility Index, and a
8 group of investment-grade vertically integrated electric utilities.

9 My recommended rate of return on common equity reflects the
10 application of my professional judgment to the indicated returns from my
11 CAPM, Risk Premium, and DCF analyses, and is predicated on a capital
12 structure consisting of 50% common equity capital. Moreover, my
13 recommended return is predicated on the assumption that: 1) the
14 Commission will approve the Company's requested capital structure for
15 ratemaking purposes which consists of 50% common equity capital as
16 proposed by witness Stadnikia.

17

18 **Q. Please describe how your testimony is organized.**

19 A. The remainder of my testimony is divided into three (3) sections:

20 (i) Regulatory Framework and Rate of Return;

21 (ii) Cost of Equity Estimates; and

22 (iii) Summary and Recommendation on Cost of Equity

23

24 The first section discusses the rudiments of rate of return regulation and the

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1 basic notions underlying rate of return. The second section contains the
2 application of CAPM, Risk Premium, and DCF tests. In the third section,
3 the results from the various approaches used in determining a fair return
4 are summarized.

5

6 **I. REGULATORY FRAMEWORK AND RATE OF RETURN**

7 **Q. What economic and financial concepts have guided your assessment**
8 **of the company's cost of common equity?**

9 A. Two fundamental economic principles underlie the appraisal of the
10 Company's cost of equity, one relating to the supply side of capital markets,
11 the other to the demand side. According to the first principle, a rational
12 investor is maximizing the performance of his portfolio only if he expects the
13 returns earned on investments of comparable risk to be the same. If not,
14 the rational investor will switch out of those investments yielding lower
15 returns at a given risk level in favor of those investment activities offering
16 higher returns for the same degree of risk. This principle implies that a
17 company will be unable to attract the capital funds it needs to meet its
18 service demands and to maintain financial integrity unless it can offer
19 returns to capital suppliers that are comparable to those achieved on
20 competing investments of similar risk. On the demand side, the second
21 principle asserts that a company will continue to invest in real physical
22 assets if the return on these investments exceeds or equals the company's
23 cost of capital. This concept suggests that a regulatory commission should
24 set rates at a level sufficient to create equality between the return on

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1 physical asset investments and the company's cost of capital.

2

3 **Q. How does DECo's cost of capital relate to that of its parent company?**

4 A. I am treating DECo as a separate stand-alone entity, distinct from the
5 parent company DTE, because it is the cost of capital for DECo that we are
6 attempting to measure and not the cost of capital for DTE's consolidated
7 activities. Financial theory clearly establishes that the cost of equity is the
8 risk-adjusted opportunity cost to the investor, in this case, DTE. The true
9 cost of capital depends on the use to which the capital is put, in this case
10 DECo's electric utility operations in the Metropolitan Detroit and
11 Southeastern Michigan. The specific source of funding an investment and
12 the cost of funds to the investor are irrelevant considerations.

13 For example, if an individual investor borrows money at the bank at an
14 after-tax cost of 8% and invests the funds in a speculative oil extraction
15 venture, the required return on the investment is not the 8% cost but rather
16 the return foregone in speculative projects of similar risk, say 20%.
17 Similarly, the required return on DECo is the return foregone in comparable
18 risk electric utility operations, and is unrelated to the parent's cost of capital.
19 The cost of capital is governed by the risk to which the capital is exposed
20 and not by the source of funds. The identity of the shareholders has no
21 bearing on the cost of equity.

22 Just as individual investors require different returns from different
23 assets in managing their personal affairs, corporations should behave in the
24 same manner. A parent company normally invests money in many

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1 operating companies of varying sizes and varying risks. These operating
2 subsidiaries pay different rates for the use of investor capital, such as long-
3 term debt capital, because investors recognize the differences in capital
4 structure, risk, and prospects between subsidiaries. Therefore, the cost of
5 investing funds in an operating utility subsidiary such as DECo is the return
6 foregone on investments of similar risk and is unrelated to the identity of the
7 investor.

8

9 **Q. Please explain how a regulated company's rates should be set under**
10 **traditional cost of service regulation.**

11 A. Under the traditional regulatory process, a regulated company's rates
12 should be set so that the company recovers its costs, including taxes and
13 depreciation, plus a fair and reasonable return on its invested capital. The
14 allowed rate of return must necessarily reflect the cost of the funds
15 obtained, that is, investors' return requirements. In determining a
16 company's rate of return, the starting point is investors' return requirements
17 in financial markets. A rate of return can then be set at a level sufficient to
18 enable the company to earn a return commensurate with the cost of those
19 funds.

20 Funds can be obtained in two general forms, debt capital and equity
21 capital. The cost of debt funds can be easily ascertained from an
22 examination of the contractual interest payments. The cost of common
23 equity funds, that is, investors' required rate of return, is more difficult to
24 estimate. It is the purpose of the next section of my testimony to estimate

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1 DECo's cost of common equity capital.

2

3 **Q. Dr. Morin, what must be considered in estimating a fair return on**
4 **common equity?**

5 A. The allowable return on equity should be commensurate with returns on
6 investments in other firms having corresponding risks. The allowed return
7 should be sufficient to assure confidence in the financial integrity of the firm,
8 in order to maintain creditworthiness and ability to attract capital on
9 reasonable terms. The attraction of capital standard focuses on investors'
10 return requirements that are generally determined using market value
11 methods, such as the Risk Premium, CAPM, or DCF methods. These
12 market value tests define fair return as the return investors anticipate when
13 they purchase equity shares of comparable risk in the financial marketplace.
14 This is a market rate of return, defined in terms of anticipated dividends and
15 capital gains as determined by expected changes in stock prices, and
16 reflects the opportunity cost of capital. The economic basis for market value
17 tests is that new capital will be attracted to a firm only if the return expected
18 by the suppliers of funds is commensurate with that available from
19 alternative investments of comparable risk.

20

21 **Q. What fundamental principles underlie the determination of a fair and**
22 **reasonable rate of return on common equity?**

23 A. The heart of utility regulation is the setting of just and reasonable rates by
24 way of a fair and reasonable return. There are two landmark United States

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1 Supreme Court cases that define the legal principles underlying the
2 regulation of a public utility's rate of return and provide the foundations for
3 the notion of a fair return:

4 1) Bluefield Water Works & Improvement Co. v. Public Service
5 Commission of West Virginia, 262 U.S. 679 (1923).

6 2) Federal Power Commission v. Hope Natural Gas Company, 320
7 U.S.391 (1944).

8 The Bluefield case set the standard against which just and
9 reasonable rates of return are measured:

10 *"A public utility is entitled to such rates as will permit it to earn a*
11 *return on the value of the property which it employs for the*
12 *convenience of the public equal to that generally being made at the*
13 *same time and in the same general part of the country on investments*
14 *in other business undertakings which are attended by corresponding*
15 *risks and uncertainties ... The return should be reasonable, sufficient*
16 *to assure confidence in the financial soundness of the utility, and*
17 *should be adequate, under efficient and economical management, to*
18 *maintain and support its credit and enable it to raise money necessary*
19 *for the proper discharge of its public duties." (Emphasis added)*
20

21 The Hope case expanded on the guidelines to be used to assess the
22 reasonableness of the allowed return. The Court reemphasized its
23 statements in the Bluefield case and recognized that revenues must cover
24 "capital costs." The Court stated:

25 *"From the investor or company point of view it is important that there*
26 *be enough revenue not only for operating expenses but also for the*
27 *capital costs of the business. These include service on the debt and*
28 *dividends on the stock ... By that standard the return to the equity*
29 *owner should be commensurate with returns on investments in other*
30 *enterprises having corresponding risks. That return, moreover, should*
31 *be sufficient to assure confidence in the financial integrity of the*
32 *enterprise, so as to maintain its credit and attract capital." (Emphasis*

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1 added)

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The United States Supreme Court reiterated the criteria set forth in Hope in Federal Power Commission v. Memphis Light, Gas & Water Division, 411 U.S. 458 (1973), in Permian Basin Rate Cases, 390 U.S. 747 (1968), and most recently in Duquesne Light Co. vs. Barasch, 488 U.S. 299 (1989). In the Permian cases, the Supreme Court stressed that a regulatory agency's rate of return order should:

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"...reasonably be expected to maintain financial integrity, attract necessary capital, and fairly compensate investors for the risks they have assumed..."

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Q. How is the fair rate of return determined?

22

A. The aggregate return required by investors is called the "cost of capital."

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The cost of capital is the opportunity cost, expressed in percentage terms, of the total pool of capital employed by the Company. It is the composite weighted cost of the various classes of capital (e.g., bonds, preferred stock, common stock) used by the utility, with the weights reflecting the proportions

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1 of the total capital that each class of capital represents. The fair return in
2 dollars is obtained by multiplying the rate of return set by the regulator by
3 the utility's "rate base." The rate base is essentially the net book value of
4 the utility's plant and other assets used to provide utility service.

5 While utilities like DECo enjoy varying degrees of monopoly in the sale
6 of public utility services, they must compete with everyone else in the free,
7 open market for the input factors of production, whether labor, materials,
8 machines, or capital. The prices of these inputs are set in the competitive
9 marketplace by supply and demand, and it is these input prices that are
10 incorporated in the cost of service computation. This is just as true for
11 capital as for any other factor of production. Since utilities and other
12 investor-owned businesses must go to the open capital market and sell their
13 securities in competition with every other issuer, there is obviously a market
14 price to pay for the capital they require, for example, the interest on debt
15 capital, or the expected return on equity.

16

17 **Q. How does the concept of a fair return relate to the concept of**
18 **opportunity cost?**

19 A. The concept of a fair return is intimately related to the economic concept of
20 "opportunity cost." When investors supply funds to a utility by buying its
21 stocks or bonds, they are not only postponing consumption, giving up the
22 alternative of spending their dollars in some other way, they are also
23 exposing their funds to risk and forgoing returns from investing their money
24 in alternative comparable risk investments. If there are differences in the

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1 risk of the investments, competition among firms for a limited supply of
2 capital will bring different prices. These differences in risk are translated by
3 the capital markets into differences in required return, in much the same
4 way that differences in the characteristics of commodities are reflected in
5 different prices.

6 The important point is that the required return on capital is set by
7 supply and demand, and is influenced by the relationship between the risk
8 and return expected for those securities and the risks expected from the
9 overall menu of available securities.

10

11 **Q. How does the company obtain its capital and how is its overall cost of**
12 **capital determined?**

13 A. The funds employed by the Company are obtained in two general forms,
14 debt capital and common equity capital. The cost of debt funds can be
15 ascertained easily from an examination of the contractual interest
16 payments. The cost of common equity funds, that is, equity investors'
17 required rate of return, is more difficult to estimate because the dividend
18 payments received from common stock are not contractual or guaranteed in
19 nature. They are uneven and risky, unlike interest payments. Once a cost
20 of common equity estimate has been developed, it can then easily be
21 combined with the embedded cost of debt, based on the utility's capital
22 structure, in order to arrive at the overall cost of capital.

23

24 **Q. What is the market required rate of return on equity capital?**

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1 A. The market required rate of return on common equity, or cost of equity, is
2 the return demanded by the equity investor. Investors establish the price for
3 equity capital through their buying and selling decisions in capital markets.
4 Investors set return requirements according to their perception of the risks
5 inherent in the investment, recognizing the opportunity cost of forgone
6 investments in other companies, and the returns available from other
7 investments of comparable risk.

8

9

II. COST OF EQUITY CAPITAL ESTIMATES

10 **Q. Dr. Morin, how did you estimate the fair rate of return on common**
11 **equity for DECo?**

12 A. I employed three methodologies: (1) the CAPM, (2) the Risk Premium, and
13 (3) the DCF methodologies. All three are market-based methodologies and
14 are designed to estimate the return required by investors on the common
15 equity capital committed to DECo.

16

17 **Q. Why did you use more than one approach for estimating the cost of**
18 **equity?**

19 A. No one individual method provides the necessary level of precision for
20 determining a fair return, but each method provides useful evidence to
21 facilitate the exercise of an informed judgment. Reliance on any single
22 method or preset formula is inappropriate when dealing with investor
23 expectations because of possible measurement errors and vagaries in
24 individual companies' market data. Examples of such vagaries include

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1 dividend suspension, insufficient or unrepresentative historical data due to a
2 recent merger, impending merger or acquisition, and a new corporate
3 identity due to restructuring activities. The advantage of using several
4 different approaches is that the results of each one can be used to check
5 the others.

6 As a general proposition, it is extremely dangerous to rely on only one
7 generic methodology to estimate equity costs. The difficulty is compounded
8 when only one variant of that methodology is employed. It is compounded
9 even further when that one methodology is applied to a single company.
10 Hence, several methodologies applied to several comparable risk
11 companies should be employed to estimate the cost of capital.

12

13 **Q. Are there any difficulties in applying cost of capital methodologies in**
14 **the current environment of change?**

15 A. Yes, there are. All the traditional cost of equity estimation methodologies
16 are difficult to implement when you are dealing with the fast-changing
17 circumstances of the electric and natural gas utility industries. This is
18 because utility company historical data have become less meaningful for an
19 industry in a state of profound change. Past earnings and dividend trends
20 are simply not indicative of the future. For example, historical growth rates
21 of earnings and dividends have been depressed by eroding margins due to
22 a variety of factors, including corporate structural transformation and the
23 transition to a more competitive environment. As a result, these historical
24 indicators are not representative of the future long-term earning power of

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1 these companies. Moreover, historical growth rates are not representative
2 of future trends for utilities involved in mergers and acquisitions, as these
3 companies going forward will not be the same companies for which
4 historical data are available.

5

6 **Q. Dr. Morin, are you aware that some regulatory commissions and some**
7 **analysts have placed principal reliance on DCF-based analyses to**
8 **determine the cost of equity for public utilities?**

9 A. Yes, I am.

10

11 **Q. Do you agree with this approach?**

12 A. While I agree that it is certainly appropriate to consider the results of the
13 DCF methodology to estimate the cost of equity, there is no proof that the
14 DCF produces a more accurate estimate of the cost of equity than other
15 methodologies. There are three broad generic methodologies available to
16 measure the cost of equity: DCF, Risk Premium, and CAPM. All of these
17 methodologies are accepted and used by the financial community and
18 supported in the financial literature.

19 When measuring the cost of common equity, which is essentially the
20 measurement of investor expectations, no one single methodology provides
21 a foolproof panacea. Each methodology requires the exercise of
22 considerable judgment on the reasonableness of the assumptions
23 underlying the methodology and on the reasonableness of the proxies used
24 to validate the theory and apply the methodology. The failure of the

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1 traditional infinite growth DCF model to account for changes in relative
2 market valuation, and the practical difficulties of specifying the expected
3 growth component are vivid examples of the potential shortcomings of the
4 DCF model. It follows that more than one methodology should be
5 employed in arriving at a judgment on the cost of equity and that these
6 methodologies should be applied to multiple groups of comparable risk
7 companies.

8 There is no single model that conclusively determines or estimates the
9 expected return for an individual firm. Each methodology has its own way
10 of examining investor behavior, its own premises, and its own set of
11 simplifications of reality. Investors do not necessarily subscribe to any one
12 method, nor does the stock price reflect the application of any one single
13 method by the price-setting investor. Absent any hard evidence, which
14 does not exist as far as I am concerned, as to which method outperforms
15 the other, all relevant evidence should be used, in order to minimize
16 judgmental error, measurement error, and conceptual infirmities. A
17 regulatory body should rely on the results of a variety of methods applied to
18 a variety of comparable groups. It is unwarranted to conclude that the DCF
19 model standing alone is necessarily the ideal or best predictor of the stock
20 price and of the cost of equity reflected in that price, just as it should not be
21 concluded that the CAPM or Risk Premium models standing alone produce
22 the perfect or best explanation of that stock price or the cost of equity. As a
23 result, all the various methodologies to estimate the cost of equity should be
24 considered.

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2 **Q. Does the financial literature support the use of more than a single**
 3 **method?**

4 A. Yes. Authoritative financial literature strongly supports the use of multiple
 5 methods. For example, Professor Eugene F. Brigham, a widely respected
 6 scholar and finance academician, asserts:

7 *In practical work, it is often best to use all three methods - CAPM,*
 8 *bond yield plus risk premium, and DCF - and then apply judgement*
 9 *when the methods produce different results. People experienced in*
 10 *estimating capital costs recognize that both careful analysis and some*
 11 *very fine judgements are required. It would be nice to pretend that*
 12 *these judgements are unnecessary and to specify an easy, precise*
 13 *way of determining the exact cost of equity capital. Unfortunately, this*
 14 *is not possible.*¹

15 In a subsequent edition of his best-selling corporate finance textbook,
 16 Dr. Brigham discusses the various methods used in estimating the cost of
 17 common equity capital, and states:

18 *However, three methods can be used: (1) the Capital Asset Pricing*
 19 *Model (CAPM), (2) the discounted cash flow (DCF) model, and (3) the*
 20 *bond-yield-plus-risk-premium approach. These methods should not*
 21 *be regarded as mutually exclusive - no one dominates the others, and*
 22 *all are subject to error when used in practice. Therefore, when faced*
 23 *with the task of estimating a company' cost of equity, we generally use*
 24 *all three methods...*²

25 Another prominent finance scholar, Professor Stewart Myers, in his
 26 best selling corporate finance textbook, points out:

27 *The constant growth [DCF] formula and the capital asset pricing*
 28 *model are two different ways of getting a handle on the same*
 29 *problem.*³

¹ E. F. Brigham and L. C. Gapenski, Financial Management Theory and Practice, p. 256 (4th ed., Dryden Press, Chicago, 1985)

² E. F. Brigham and L. C. Gapenski, Financial Management Theory and Practice, p. 348 (8th ed., Dryden Press, Chicago, 2005)

³ R. A. Brealey and S. C. Myers, Principles of Corporate Finance, p. 182 (3rd ed., McGraw Hill, New York, 1988)

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In an earlier article, Professor Myers explains:

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Use more than one model when you can. Because estimating the opportunity cost of capital is difficult, only a fool throws away useful information. That means you should not use any one model or measure mechanically and exclusively. Beta is helpful as one tool in a kit, to be used in parallel with DCF models or other techniques for interpreting capital market data.⁴

11

Q. Does the broad usage of the DCF methodology in past regulatory

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proceedings indicate that it is superior to other methods?

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A. No, it does not. Uncritical acceptance of the standard DCF equation vests

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the model with a degree of reliability that is simply not justified. One of the

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leading experts on regulation, Dr. Charles F. Phillips discusses the dangers

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of relying solely on the DCF model:

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[U]se of the DCF model for regulatory purposes involves both theoretical and practical difficulties. The theoretical issues include the assumption of a constant retention ratio (i.e. a fixed payout ratio) and the assumption that dividends will continue to grow at a rate 'g' in perpetuity. Neither of these assumptions has any validity, particularly in recent years. Further, the investors' capitalization rate and the cost of equity capital to a utility for application to book value (i.e. an original cost rate base) are identical only when market price is equal to book value. Indeed, DCF advocates assume that if the market price of a utility's common stock exceeds its book value, the allowable rate of return on common equity is too high and should be lowered; and vice versa. Many question the assumption that market price should equal book value, believing that '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.

...[T]here remains the circularity problem: Since regulation establishes a level of authorized earnings which, in turn, implicitly influences dividends per share, estimation of the growth rate from such data is an inherently circular process. For all of these reasons, the DCF model

⁴ S. C. Myers, "On the Use of Modern Portfolio Theory in Public Utility Rate Cases: Comment," Financial Management, p. 67 (Autumn 1978)

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1 *suggests a degree of precision which is in fact not present and leaves*
2 *wide room for controversy about the level of k [cost of equity].⁵*
3

4 Dr. Charles F. Phillips also discusses the dangers of relying solely on the
5 CAPM model because of the lack of realism of certain of its stringent
6 assumptions, as is the case for any model in the social sciences.

7 Sole reliance on any one model, whether it is DCF, CAPM, or Risk
8 Premium, simply ignores the capital market evidence and investors' use of
9 the other theoretical frameworks. The DCF model is only one of many tools
10 to be employed in conjunction with other methods to estimate the cost of
11 equity. It is not a superior methodology that should supplant other financial
12 theory and market evidence. The same is true of the CAPM.

13

14 **Q. Do the assumptions underlying the DCF model require that the model**
15 **be treated with caution?**

16 A. Yes, particularly in today's rapidly changing utility industry. Even ignoring
17 the fundamental thesis that several methods and/or variants of such
18 methods should be used in measuring equity costs, the DCF methodology,
19 as those familiar with the industry and the accepted norms for estimating
20 the cost of equity are aware, is problematic for use in estimating cost of
21 equity at this time.

22 Several fundamental structural changes have transformed the energy
23 utility industry since the standard DCF model and its assumptions were
24 developed. For example, deregulation, increased wholesale competition

⁵ C. F. Phillips, The Regulation of Public Utilities Theory and Practice (Public Utilities Reports,

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1 triggered by national policy, accounting rule changes, changes in customer
2 attitudes regarding utility services, the evolution of alternative energy
3 sources, improvements in generation efficiencies, and mergers-acquisitions
4 have all influenced stock prices in ways that have deviated substantially
5 from the assumptions of the DCF model. These changes suggest that
6 some of the fundamental assumptions underlying the standard DCF model,
7 particularly that of constant growth and constant relative market valuation,
8 for example price/earnings ratios and market-to-book ratios, are
9 problematic at this point in time for utility stocks, and that, therefore,
10 alternate methodologies to estimate the cost of common equity should be
11 accorded at least as much weight as the DCF method.

12

13 **Q. Is the constant relative market valuation assumption inherent in the**
14 **DCF model always reasonable?**

15 A. No, not always. Caution must be exercised when implementing the
16 standard DCF model in a mechanistic fashion, for it may fail to recognize
17 changes in relative market valuations over time. The traditional DCF model
18 is not equipped to deal with surges in market-to-book (M/B) and price-
19 earnings (P/E) ratios. The standard DCF model assumes a constant
20 market valuation multiple, that is, a constant P/E ratio and a constant M/B
21 ratio. Stated another way, the model assumes that investors expect the
22 ratio of market price to dividends (or earnings) in any given year to be the
23 same as the current ratio of market price to dividend (or earnings), and that

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1 the stock price will grow at the same rate as the book value. This is a
2 necessary result of the infinite growth assumption. This assumption is
3 unrealistic under current conditions. The DCF model is not equipped to
4 deal with sudden surges in M/B and P/E ratios, as was experienced by a
5 number of utility stocks in recent years.

6 In short, caution and judgment are required in interpreting the results of
7 the DCF model because of: (1) the effect of changes in risk and growth on
8 electric utilities, (2) the disconnect between the tenets of the DCF model
9 and the characteristics of utility stocks in the current capital market
10 environment, and (3) the practical difficulties associated with the growth
11 component of the DCF model. Hence, there is a clear need to go beyond
12 the DCF results and take into account the results produced by alternate
13 methodologies in arriving at a return on equity ("ROE") recommendation.

14

15 **Q. Do the assumptions underlying the CAPM require that the model be**
16 **treated with caution?**

17 A. Yes, as was the case with the DCF model, the assumptions underlying the
18 CAPM are stringent. Moreover, the empirical validity of the CAPM has
19 been the subject of intense research in recent years. Although the CAPM
20 provides useful evidence, it must be complemented by other
21 methodologies.

22

23 **A. CAPM Estimates**

24 **Q. Please describe your application of the CAPM risk premium approach.**

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1 A. My first two risk premium estimates are based on the CAPM and on an
2 empirical approximation to the CAPM (ECAPM). The CAPM is a
3 fundamental paradigm of finance. The fundamental idea underlying the
4 CAPM is that risk-averse investors demand higher returns for assuming
5 additional risk, and higher-risk securities are priced to yield higher expected
6 returns than lower-risk securities. The CAPM quantifies the additional
7 return, or risk premium, required for bearing incremental risk. It provides a
8 formal risk-return relationship anchored on the basic idea that only market
9 risk matters, as measured by beta. According to the CAPM, securities are
10 priced such that:

$$11 \quad \text{EXPECTED RETURN} = \text{RISK-FREE RATE} + \text{RISK PREMIUM}$$

12 Denoting the risk-free rate by R_F and the return on the market as a
13 whole by R_M , the CAPM is stated as follows:

$$14 \quad K = R_F + \beta(R_M - R_F)$$

15 This is the seminal CAPM expression, which states that the return required
16 by investors is made up of a risk-free component, R_F , plus a risk premium
17 given by β times $(R_M - R_F)$. To derive the CAPM risk premium estimate,
18 three quantities are required: the risk-free rate (R_F), beta (β), and the
19 market risk premium, $(R_M - R_F)$. For the risk-free rate, I used 5.0%, based
20 on current interest rates on long-term U.S. Treasury bonds. For beta, I
21 used 0.85 and for the market risk premium I used 7.8%. These respective
22 inputs to the CAPM are explained below.

23

24 **Q. What risk-free rate did you use in your CAPM and risk premium**

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1 **analyses?**

2 A. To implement the CAPM and Risk Premium methods, an estimate of the
3 risk-free return is required as a benchmark. As a proxy for the risk-free
4 rate, I have relied on the actual and forecast yields on 30-year Treasury
5 bonds.

6 The appropriate proxy for the risk-free rate in the CAPM is the return
7 on the longest term Treasury bond possible. This is because common
8 stocks are very long-term instruments more akin to very long-term bonds
9 rather than to short-term or intermediate-term Treasury notes. In a risk
10 premium model, the ideal estimate for the risk-free rate has a term to
11 maturity equal to the security being analyzed. Since common stock is a
12 very long-term investment because the cash flows to investors in the form
13 of dividends last indefinitely, the yield on the longest-term possible
14 government bonds, that is the yield on 30-year Treasury bonds, is the best
15 measure of the risk-free rate for use in the CAPM. The expected common
16 stock return is based on very long-term cash flows, regardless of an
17 individual's holding time period. Moreover, utility asset investments
18 generally have very long-term useful lives and should correspondingly be
19 matched with very long-term maturity financing instruments.

20 While long-term Treasury bonds are potentially subject to interest rate
21 risk, this is only true if the bonds are sold prior to maturity. A substantial
22 fraction of bond market participants, usually institutional investors with long-
23 term liabilities (pension funds, insurance companies), in fact hold bonds
24 until they mature, and therefore are not subject to interest rate risk.

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1 Moreover, institutional bondholders neutralize the impact of interest rate
2 changes by matching the maturity of a bond portfolio with the investment
3 planning period, or by engaging in hedging transactions in the financial
4 futures markets. The merits and mechanics of such immunization
5 strategies are well documented by both academicians and practitioners.

6 Another reason for utilizing the longest maturity Treasury bond
7 possible is that common equity has an infinite life span, and the inflation
8 expectations embodied in its market-required rate of return will therefore be
9 equal to the inflation rate anticipated to prevail over the very long-term. The
10 same expectation should be embodied in the risk free rate used in applying
11 the CAPM model. It stands to reason that the actual yields on 30-year
12 Treasury bonds will more closely incorporate within their yield the inflation
13 expectations that influence the prices of common stocks than do short-term
14 or intermediate-term U.S. Treasury notes.

15 Among U.S. Treasury securities, 30-year Treasury bonds have the
16 longest term to maturity and the yield on such securities should be used as
17 proxies for the risk-free rate in applying the CAPM, provided there are no
18 anomalous conditions existing in the 30-year Treasury market. In the
19 absence of such conditions, I have relied on the yield on 30-year Treasury
20 bonds in implementing the CAPM and risk premium methods.

21

22 **Q. Dr. Morin, why did you reject short-term interest rates as a proxies for**
23 **the risk-free rate in implementing the CAPM?**

24 **A.** Short-term rates are volatile, fluctuate widely, and are subject to more

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1 random disturbances than are long-term rates. Short-term rates are largely
2 administered rates. For example, Treasury bills are used by the Federal
3 Reserve as a policy vehicle to stimulate the economy and to control the
4 money supply, and are used by foreign governments, companies, and
5 individuals as a temporary safe-house for money.

6 As a practical matter, it makes no sense to match the return on
7 common stock to the yield on 90-day Treasury Bills. This is because short-
8 term rates, such as the yield on 90-day Treasury Bills, fluctuate widely,
9 leading to volatile and unreliable equity return estimates. Moreover, yields
10 on 90-day Treasury Bills typically do not match the equity investor's
11 planning horizon. Equity investors generally have an investment horizon far
12 in excess of 90 days.

13 As a conceptual matter, short-term Treasury Bill yields reflect the
14 impact of factors different from those influencing the yields on long-term
15 securities such as common stock. For example, the premium for expected
16 inflation embedded into 90-day Treasury Bills is likely to be far different than
17 the inflationary premium embedded into long-term securities yields. On
18 grounds of stability and consistency, the yields on long-term Treasury
19 bonds match more closely with common stock returns.

20

21 **Q. What is your estimate of the risk-free rate in applying the CAPM?**

22 A. The level of U.S. Treasury 30-year long-term bond yields prevailing in April
23 2006 as reported in the Value Line Investment Analyzer ("VLIA") April 2006
24 edition was 5.0%. I also examined the long-term interest rate forecasts

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1 contained in the April 2006 edition of the Blue Chip Financial Forecasts.
2 The consensus forecast reported in that publication for the yield on 30-year
3 Treasury bonds was 5.1%, virtually identical to the current level of 5.0%. I
4 therefore used 5.0% as my estimate of the risk-free rate component of the
5 CAPM.

6

7 **Q. How did you select the beta for your CAPM analysis?**

8 A. A major thrust of modern financial theory as embodied in the CAPM is that
9 perfectly diversified investors can eliminate the company-specific
10 component of risk, and that only market risk remains. The latter is
11 technically known as "beta", or "systematic risk". The beta coefficient
12 measures change in a security's return relative to that of the market. The
13 beta coefficient states the extent and direction of movement in the rate of
14 return on a stock relative to the movement in the rate of return on the
15 market as a whole. The beta coefficient indicates the change in the rate of
16 return on a stock associated with a one percentage point change in the rate
17 of return on the market, and thus measures the degree to which a particular
18 stock shares the risk of the market as a whole. Modern financial theory has
19 established that beta incorporates several economic characteristics of a
20 corporation which are reflected in investors' return requirements.

21 As a wholly-owned subsidiary of DTE, DECo is not publicly traded, and
22 therefore, proxies must be used for DECo. I examined the betas of a
23 sample of widely-traded investment-grade vertically integrated electric
24 utilities covered by Standard & Poor's with at least 50% of their revenues

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1 from regulated utility operations. This group is examined in more detail
2 later in my testimony, in connection with the DCF estimates of the cost of
3 common equity. In order to minimize the well-known thin trading bias in
4 measuring beta, I only considered those companies whose market
5 capitalization exceeded \$500 million. As displayed on page 1 of Exhibit
6 DE-12, Schedule D4-1, the average beta for the group is 0.85.

7 As a check on the beta estimate, I examined the average beta for the
8 electric utility industry, as represented by the electric utilities that make up
9 Moody's Electric Utility Index. As displayed on page 2 of Exhibit DE-12,
10 Schedule D4-1, the average beta for the group is 0.88 and becomes 0.85
11 with the two outliers (Duke Energy, American Electric Power) removed from
12 the group. These two estimates are nearly identical to the previous
13 estimates. Based on these results, I shall use 0.85 as a reasonable
14 estimate for the beta applicable to DECo.

15
16 **Q. What market risk premium estimate did you use in your CAPM**
17 **analysis?**

18 A. For the market risk premium ("MRP"), I used 7.5%. This estimate was
19 based on the results of both forward-looking and historical studies of long-
20 term risk premiums. First, the Ibbotson Associates study, *Stocks, Bonds,*
21 *Bills, and Inflation, 2006 Yearbook*, compiling historical returns from 1926 to
22 2005, shows that a broad market sample of common stocks outperformed
23 long-term U. S. Treasury bonds by 6.5%. The historical market risk
24 premium over the income component of long-term Treasury bonds rather

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1 than over the total return is 7.1%⁶. Ibbotson Associates recommend the
2 use of the latter as a more reliable estimate of the historical market risk
3 premium, and I concur with this viewpoint. The historical MRP should be
4 computed using the income component of bond returns because the intent,
5 even using historical data, is to identify an expected market risk premium.
6 The more accurate way to estimate the market risk premium from historic
7 data is to use the income return, not total returns on government bonds, as
8 explained at page 66 of Ibbotson Associates, Stocks, Bonds, Bills, and
9 Inflation: Valuation Edition, 2005 Yearbook. This is because the income
10 component of total bond return (*i.e.* the coupon rate) is a far better estimate
11 of expected return than the total return (*i.e.* the coupon rate + capital gain),
12 as realized capital gains/losses are largely unanticipated by bond investors.
13 The long-horizon (1926-2005) market risk premium (based on income
14 returns, as required) is specifically calculated to be 7.1% rather than 6.5%.

15

16 **Q. Why did you use long time periods in arriving at your historical market**
17 **risk premium estimate?**

18 A. Because realized returns can be substantially different from prospective
19 returns anticipated by investors when measured over short time periods, it
20 is important to employ returns realized over long time periods rather than

⁶ Because 30-year bonds were not always traded or even available throughout the entire 1926-2005 long period covered in the Ibbotson Associate Study of historical returns, the latter study relied on bond return data based on 20-year Treasury bonds. To the extent that the normal yield curve is virtually flat above maturities of 20 years over most of the period covered in the Ibbotson study, the difference in yield is not material. In fact, the difference in yield between 30-year and 20-year bonds is actually negative. The average difference in yield over the 1977-2006 period is 13 basis points, that is, the yield on 20-year bonds is slightly higher than the yield on 30-year bonds.

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1 returns realized over more recent time periods when estimating the market
2 risk premium with historical returns. Therefore, a risk premium study should
3 consider the longest possible period for which data are available. Short-run
4 periods during which investors earned a lower risk premium than they
5 expected are offset by short-run periods during which investors earned a
6 higher risk premium than they expected. Only over long time periods will
7 investor return expectations and realizations converge.

8 I have therefore ignored realized risk premiums measured over short
9 time periods, since they are heavily dependent on short-term market
10 movements. Instead, I relied on results over periods of enough length to
11 smooth out short-term aberrations, and to encompass several business and
12 interest rate cycles. The use of the entire study period in estimating the
13 appropriate market risk premium minimizes subjective judgment and
14 encompasses many diverse regimes of inflation, interest rate cycles, and
15 economic cycles.

16 To the extent that the estimated historical equity risk premium follows
17 what is known in statistics as a random walk, one should expect the equity
18 risk premium to remain at its historical mean. The best estimate of the
19 future risk premium is the historical mean. Since I found no evidence that
20 the market price of risk or the amount of risk in common stocks has
21 changed over time, that is, no significant serial correlation in the Ibbotson
22 study, it is reasonable to assume that these quantities will remain stable in
23 the future.

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1

2 **Q. Please describe your prospective approach in deriving the market risk**
3 **premium in the CAPM analysis.**

4 A. For my prospective estimate of the market risk premium, I applied a DCF
5 analysis to the aggregate equity market using Value Line's VLIA software.
6 The dividend yield on the dividend-paying stocks that make up the Value
7 Line Composite index made up of some 1800 stocks is currently 1.2%
8 (VLIA 04/2006 edition), and the average projected dividend growth rate is
9 11.3%. Adding the dividend yield to the growth component produces an
10 expected return on the aggregate equity market of 12.5%. Following the
11 tenets of the DCF model, the spot dividend yield must be converted into an
12 expected dividend yield by multiplying it by one plus the growth rate. This
13 brings the expected return on the aggregate equity market to 12.7%.
14 Recognition of the quarterly timing of dividend payments rather than the
15 annual timing of dividends assumed in the annual DCF model brings the
16 market risk premium estimate to approximately 12.9%. Subtracting the risk-
17 free rate of 5.0% from the latter, the implied risk premium is 7.9% over long-
18 term U.S. Treasury bonds. The average of the historical (7.1%) and
19 prospective market risk premium (7.9%) estimates is 7.5%.

20 As a check on my market risk premium estimate, I examined a recent
21 2003 comprehensive article published in Financial Management, Harris,
22 Marston, Mishra, and O'Brien ("HMMO") that provides estimates of the ex
23 ante expected returns for S&P 500 companies over the period 1983-1998⁷.

⁷ Harris, R. S., Marston, F. C., Mishra, D. R., and O'Brien, T. J., "Ex Ante Cost of Equity

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1 HMMO measure the expected rate of return (cost of equity) of each
2 dividend-paying stock in the S&P 500 for each month from January 1983 to
3 August 1998 by using the constant growth DCF model. The prevailing risk-
4 free rate for each year was then subtracted from the expected rate of return
5 for the overall market to arrive at the market risk premium for that year. The
6 table below, drawn from HMMO Table 2, displays the average prospective
7 risk premium estimate for each year from 1983 to 1998. The average
8 market risk premium estimate for the overall period is 7.2%, which is
9 reasonably close to my own estimate of 7.5%.

10

11	Year	DCF Market Risk Premium
12	1983	6.6%
13	1984	5.3%
14	1985	5.7%
15	1986	7.4%
16	1987	6.1%
17	1988	6.4%
18	1989	6.6%
19	1990	7.1%
20	1991	7.5%
21	1992	7.8%
22	1993	8.2%
23	1994	7.3%
24	1995	7.7%
25	1996	7.8%
26	1997	8.2%
27	1998	9.2%
28		
29	MEAN	7.2%
30		

31 **Q. What is your risk premium estimate of the Company's cost of equity**
32 **using the CAPM approach?**

33 A. Inserting those input values in the CAPM equation, namely a risk-free rate
34 of 5.0%, a beta of 0.85, and a market risk premium of 7.5%, the CAPM

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1 estimate of the cost of common equity is: $5.0\% + 0.85 \times 7.5\% = 11.4\%$.

2 This estimate becomes 11.7% with flotation costs, discussed later in my
3 testimony.

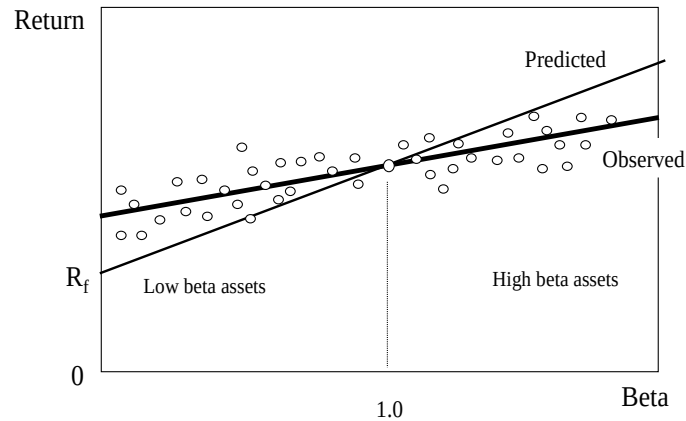
4

5 **Q. What is your risk premium estimate using the empirical version of the**
6 **CAPM?**

7 A. With respect to the empirical validity of the plain vanilla CAPM, there have
8 been countless empirical tests of the CAPM to determine to what extent
9 security returns and betas are related in the manner predicted by the
10 CAPM. This literature is summarized in Chapter 13 of my book, Regulatory
11 Finance and in Chapter 6 of my latest book, The New Regulatory Finance,
12 published by Public Utilities Report Inc. The results of the tests support the
13 idea that beta is related to security returns, that the risk-return tradeoff is
14 positive, and that the relationship is linear. The contradictory finding is that
15 the risk-return tradeoff is not as steeply sloped as the predicted CAPM.
16 That is, empirical research has long shown that low-beta securities earn
17 returns somewhat higher than the CAPM would predict, and high-beta
18 securities earn less than predicted. A CAPM-based estimate of cost of
19 capital underestimates the return required from low-beta securities and
20 overstates the return required from high-beta securities, based on the
21 empirical evidence. This is one of the most well-known results in finance,
22 and it is displayed graphically below.

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CAPM: Predicted vs Observed Returns



A number of variations on the original CAPM theory have been proposed to explain this finding. The ECAPM makes use of these empirical findings. The ECAPM estimates the cost of capital with the equation:

$$K = R_F + \alpha + \beta \times (MRP - \alpha)$$

where α is the "alpha" of the risk-return line, a constant, MRP is the market risk premium ($R_M - R_F$), and the other symbols are defined as usual. Inserting the long-term risk-free rate as a proxy for the risk-free rate, an alpha in the range of 1% - 2%, and reasonable values of beta and the MRP in the above equation produces results that are indistinguishable from the following ECAPM expression:

$$K = R_F + 0.25 (R_M - R_F) + 0.75 \beta (R_M - R_F)$$

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1 An alpha range of 1% - 2% is somewhat lower than that estimated
2 empirically. The use of a lower value for alpha leads to a lower estimate
3 of the cost of capital for low-beta stocks such as regulated utilities. This
4 is because the use of a long-term risk-free rate rather than a short-term
5 risk-free rate already incorporates some of the desired effect of using the
6 ECAPM. That is, the long-term risk-free rate version of the CAPM has a
7 higher intercept and a flatter slope than the short-term risk-free version
8 which has been tested. This is also because the use of adjusted betas
9 rather than raw betas also incorporate some of the desired effect of
10 using the ECAPM. Thus, it is reasonable to apply a conservative alpha
11 adjustment.

12

13 **Q. Is the use of the ECAPM consistent with the use of adjusted betas?**

14 A. Yes, it is. Some have argued that the use of the ECAPM is inconsistent with
15 the use of adjusted betas, such as those supplied by Value Line and
16 Bloomberg. This is because the reason for using the ECAPM is to allow for
17 the tendency of betas to regress toward the mean value of 1.00 over time,
18 and, since Value Line betas are already adjusted for such trend, an ECAPM
19 analysis results in double-counting. This argument is erroneous.
20 Fundamentally, the ECAPM is not an adjustment, increase or decrease, in
21 beta. This is obvious from the fact that the expected return on high beta
22 securities is actually lower than that produced by the CAPM estimate. The
23 ECAPM is a formal recognition that the observed risk-return tradeoff is
24 flatter than predicted by the CAPM based on a myriad of empirical

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1 evidence. The ECAPM and the use of adjusted betas comprised two
2 separate features of asset pricing. Even if a company's beta is estimated
3 accurately, the CAPM still understates the return for low-beta stocks. Even
4 if the ECAPM is used, the return for low-beta securities is understated if the
5 betas are understated. Referring back to the previous graph, the ECAPM
6 is a return (vertical axis) adjustment and not a beta (horizontal axis)
7 adjustment. Both adjustments are necessary. Moreover, the use of
8 adjusted betas compensates for interest rate sensitivity of utility stocks not
9 captured by unadjusted betas.

10 Appendix B contains a full discussion of the ECAPM, including its
11 theoretical and empirical underpinnings. In short, the following equation
12 provides a viable approximation to the observed relationship between risk
13 and return, and provides the following cost of equity capital estimate:

$$K = R_F + 0.25 (R_M - R_F) + 0.75 \beta (R_M - R_F)$$

15 Inserting 5.0% for the risk-free rate R_F , a market risk premium of 7.5% for
16 $(R_M - R_F)$ and a beta of 0.85 in the above equation, the return on common
17 equity is 11.7% without flotation costs and 12.0% with flotation costs.

18

19 **B. Risk Premium Estimates**

20 **Q. Please describe your historical risk premium analysis of the electric**
21 **utility industry.**

22 **A.** As a proxy for the risk premium applicable to DECo, I estimated the
23 historical risk premium for the electric utility industry with an annual time
24 series analysis applied to the electric utility industry as a whole, using

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1 Moody's Electric Utility Index as an industry proxy. The analysis is depicted
2 on Exhibit DE-12, Schedule D4-2. The risk premium was estimated by
3 computing the actual return on equity capital for Moody's Index for each
4 year, using the actual stock prices and dividends of the index, and then
5 subtracting the long-term government bond return for that year.

6 The average risk premium over the period was 5.6% (page 2) over
7 long-term Treasury bonds. Given that long-term Treasury bonds are
8 currently yielding 5.0%, the implied cost of equity for the average risk
9 electric utility from this particular method is $5.0\% + 5.6\% = 10.6\%$ without
10 flotation costs and 10.9% with flotation costs. The need for a flotation cost
11 allowance is discussed at length later in my testimony. I note that over
12 most of this lengthy historical period, both the T&D and generation
13 businesses were indistinguishable in risk, that is, were fully integrated
14 regulated monopolies subject to the regulatory compact.

15 The historical risk premium analysis for the electric utility industry stops
16 in 2001 because the annual Moody's Public Utility Manual from which the
17 data were drawn was discontinued following the acquisition of Moody's by
18 Mergent in 2002. In view of the rising risk premium allowed by regulators
19 documented in the next section of my testimony, it would not be
20 unreasonable to expect that the current utility risk premium exceeds the
21 historical average. I did examine some more recent historical bond return
22 and equity return data based on the S&P Utility Index instead of Moody's
23 Electric Utility Index. The addition of 2002-2005 data actually raises the

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1 historical risk premium slightly. This is not surprising in view of the rising
2 utility equity market during the 2003-2005 period.

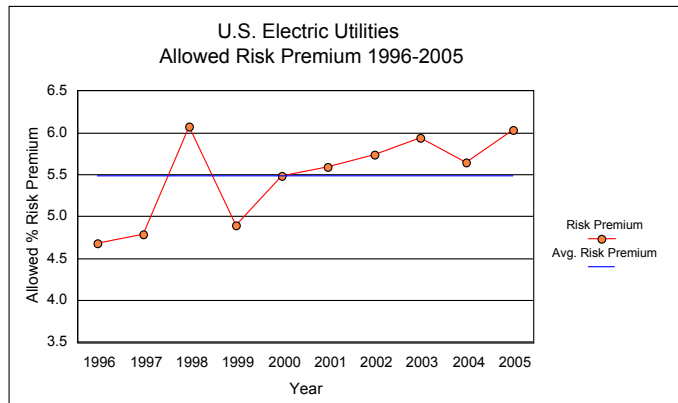
3

4 **C. Allowed Risk Premiums**

5 **Q. Please describe your analysis of allowed risk premiums in the electric**
6 **utility industry.**

7 A. To estimate the Company's cost of common equity, I also examined the
8 historical risk premiums implied in the returns on equity allowed by
9 regulatory commissions for electric utilities over the last decade relative to
10 the contemporaneous level of the long-term Treasury bond yield. The
11 allowed equity returns are reported on a quarterly basis by Regulatory
12 Research Associates. The average common equity return spread over
13 long-term Treasury yields was 5.5% for the 1996-2005 time period, as
14 shown by the horizontal line in the graph below. The graph also shows the
15 year-by-year allowed risk premium. As indicated by the rising arrow on the
16 graph, the escalating trend of the risk premium in response to lower interest
17 rates and rising competition and restructuring is noteworthy.

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A careful review of these common equity decisions relative to interest rate trends reveals a narrowing of the risk premium in times of rising interest rates, and a widening of the premium as interest rates fall. The following statistical relationship between the risk premium (RP) and interest rates (YIELD) emerges over the last decade:

$$RP = 9.1508 - 0.6505 \text{ YIELD} \quad R^2 = 0.74$$

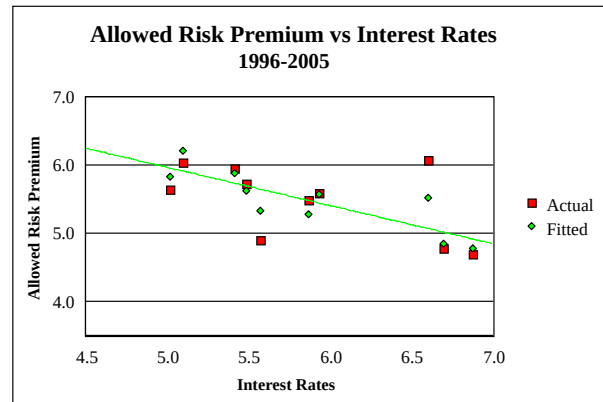
$$(t = 4.7)$$

The relationship is highly statistically significant⁸ as indicated by the high R^2 and statistically significant t-value of the slope coefficient. The figure below shows a clear inverse relationship between the allowed risk premium and

⁸ The coefficient of determination R^2 , sometimes called the “goodness of fit measure” is a measure of the degree of explanatory power of a statistical relationship. It is simply the ratio of the explained portion to the total sum of squares. The higher R^2 the higher is the degree of the overall fit of the estimated regression equation to the sample data. The t-statistic is a standard measure of the statistical significance of an independent variable in a regression relationship. A t-value above 2.0 is considered highly significant.

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1

interest rates as revealed in past common equity decisions.



2

3 Inserting the current long-term Treasury bond yield of 5.0% in the above
4 equation suggests that a risk premium estimate of 5.9% should be allowed
5 for the average risk electric utility, implying a cost of equity of 10.9% for the
6 average risk utility.

7

8 **D. DCF ESTIMATES**

9 **Q. Please describe the DCF approach to estimating the cost of equity**
10 **capital.**

11 **A.** According to DCF theory, the value of any security to an investor is the
12 expected discounted value of the future stream of dividends or other
13 benefits. One widely used method to measure these anticipated benefits in
14 the case of a non-static company is to examine the current dividend plus

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1 the increases in future dividend payments expected by investors. This
2 valuation process can be represented by the following formula, which is the
3 traditional DCF model:

$$4 \quad K_e = D_1/P_o + g$$

5 where: K_e = investors' expected return on equity

6 D_1 = expected dividend at the end of the coming year

7 P_o = current stock price

8 g = expected growth rate of dividends, earnings, book value,
9 stock price

10

11 The traditional DCF formula states that under certain assumptions, which
12 are described in the next paragraph, the equity investor's expected return,
13 K_e , can be viewed as the sum of an expected dividend yield, D_1/P_o , plus the
14 expected growth rate of future dividends and stock price, g . The returns
15 anticipated at a given market price are not directly observable and must be
16 estimated from statistical market information. The idea of the market value
17 approach is to infer ' K_e ' from the observed share price, the observed
18 dividend, and an estimate of investors' expected future growth.

19 The assumptions underlying this valuation formulation are well known,
20 and are discussed in detail in Chapter 4 of my reference book, Regulatory
21 Finance. The traditional DCF model requires the following main
22 assumptions: a constant average growth trend for both dividends and
23 earnings, a stable dividend payout policy, a discount rate in excess of the
24 expected growth rate, and a constant price-earnings multiple, which implies

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1 that growth in price is synonymous with growth in earnings and dividends.
2 The traditional DCF model also assumes that dividends are paid at the end
3 of each year when in fact dividend payments are normally made on a
4 quarterly basis.

5

6 **Q. Is the constant growth DCF model applicable under all**
7 **circumstances?**

8 A. No, it is not, as I discussed earlier in my testimony. For companies in a
9 mature industry, such as the electric utility industry had been until recent
10 years, a constant growth rate is a reasonable assumption. For companies
11 in a more dynamic evolving industry, such as the current electric utility
12 business, this assumption may not be reasonable; the dividend growth rate
13 may be expected to converge only over time toward a steady-state long-run
14 level.

15

16 **Q. How did you estimate DECo's cost of equity with the DCF model?**

17 A. I applied the DCF model to three proxies for DECo: the parent company
18 DTE, a group of vertically integrated electric utilities, and a group consisting
19 of the electric utilities that make up Moody's electric utilities index.

20 In order to apply the DCF model, two components are required: the
21 expected dividend yield (D_1/P_0) and the expected long-term growth (g).
22 The expected dividend D_1 in the annual DCF model can be obtained by
23 multiplying the current indicated annual dividend rate by the growth factor (1
24 $+ g$).

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1 From a conceptual viewpoint, the stock price to employ in calculating
2 the dividend yield is the current price of the security at the time of
3 estimating the cost of equity. The reason is that current stock prices
4 provide a better indication of expected future prices than any other price in
5 an efficient market. An efficient market implies that prices adjust rapidly to
6 the arrival of new information. Therefore, current prices reflect the
7 fundamental economic value of a security. A considerable body of
8 empirical evidence indicates that capital markets are efficient with respect
9 to a broad set of information. This implies that observed current prices
10 represent the fundamental value of a security, and that a cost of capital
11 estimate should be based on current prices.

12 In implementing the DCF model, I have used the dividend yields
13 reported in the April 2006 edition of Value Line's VLIA. Basing dividend
14 yields on average results from a large group of companies reduces the
15 concern that the vagaries of individual company stock prices will result in an
16 unrepresentative dividend yield.

17

18 **Q. How did you estimate the growth component of the DCF model?**

19 A. The principal difficulty in calculating the required return by the DCF
20 approach is in ascertaining the growth rate that investors currently expect.
21 Since no explicit estimate of expected growth is observable, proxies must
22 be employed.

23 As proxies for expected growth, I examined growth estimates
24 developed by professional analysts employed by large investment

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1 brokerage institutions. Projected long-term growth rates actually used by
2 institutional investors to determine the desirability of investing in different
3 securities influence investors' growth anticipations. These forecasts are
4 made by large reputable organizations, and the data are readily available to
5 investors and are representative of the consensus view of investors.
6 Because of the dominance of institutional investors in investment
7 management and security selection, and their influence on individual
8 investment decisions, analysts' growth forecasts influence investor growth
9 expectations and provide a sound basis for estimating the cost of equity with
10 the DCF model. Growth rate forecasts of several analysts are available
11 from published investment newsletters and from systematic compilations of
12 analysts' forecasts, such as those tabulated by Zacks Investment Research
13 Inc. ("Zacks"). I used analysts' long-term growth forecasts contained in
14 Zacks as proxies for investors' growth expectations in applying the DCF
15 model. I also used Value Line's growth forecast as an additional proxy.

16

17 **Q. Why did you reject the use of historical growth rates in applying the**
18 **DCF model to electric utilities?**

19 A. Columns c, d, and e of Exhibit DE-12, Schedule D4-3 display the historical
20 growth in earnings, dividends, and book value per share over the last five
21 years for the electric utility companies that make up Value Line's Electric
22 Utility composite group. The average historical growth rates in earnings,
23 dividends, and book value for the group are 2.1%, 0.0%, and 3.2% over the
24 past 5 years, respectively. Several companies have experienced a

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1 negative earnings growth rate, as evidenced by the numerous historical
2 growth rates reported on the table that are negative.

3 These historical growth rates have little relevance as proxies for future
4 long-term growth at this time. They are downward-biased by the sluggish
5 earnings performance in the last five years, due to the structural
6 transformation of the electric utility industry from a regulated monopoly to a
7 more competitive environment. Several electric utility companies have
8 experienced earnings growth rate. The industry as a whole has
9 experienced zero dividend growth over the past five years. These anemic
10 historical growth rates are certainly not representative of these companies'
11 long-term earning power, and produce unreasonably low DCF estimates,
12 well outside reasonable limits of probability and common sense. To
13 illustrate, adding the historical growth rates of 2.1%, 0.0%, and 3.2% to the
14 average dividend yield of approximately 4.0% prevailing currently for those
15 same companies, produces preposterous cost of equity estimates of 6.1%,
16 4.0%, and 7.2%, using earnings, dividends, and book value growth rates,
17 respectively. Of course, these estimates of equity costs are outlandish as
18 they are less than the cost of long-term debt for these companies.

19 I have therefore rejected historical growth rates as proxies for expected
20 growth in the DCF calculation. In any event, historical growth rates are
21 somewhat redundant because such historical growth patterns are already
22 incorporated in analysts' growth forecasts that should be used in the DCF
23 model.

24

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1 **Q. Did you consider dividend growth proxies in applying the DCF model?**

2 A. No, I did not. Earnings and dividends are not expected to grow at the same
3 rate in the future. According to the latest edition of Value Line, the
4 expected dividend growth of 2.7% for the electric utility industry, as proxied
5 by Moody's Electric Utility Index companies, is significantly less than the
6 expected earnings growth of 5.4% over the next few years.

7 Whenever the dividend payout ratio is expected to change, the
8 intermediate growth rate in dividends cannot equal the long-term growth
9 rate, because dividend/earnings growth must adjust to the changing payout
10 ratio. The assumptions of constant perpetual growth and constant payout
11 ratio are clearly not met. The implementation of the standard DCF model is
12 of questionable relevance in this circumstance.

13 Dividend growth rates are unlikely to provide a meaningful guide to
14 investors' growth expectations for electric utilities in general. This is
15 because electric utilities' dividend policies have become increasingly
16 conservative as business risks in the industry have intensified steadily.
17 Dividend growth has remained largely stagnant in past years as utilities are
18 increasingly conserving financial resources in order to hedge against rising
19 business risks. To wit, the dividend payout ratios of energy utilities has
20 steadily decreased from about 80% ten years ago to the 60% level today.
21 As a result, investors' attention has shifted from dividends to earnings.
22 Therefore, earnings growth provides a more meaningful guide to investors'
23 long-term growth expectations. After all, it is growth in earnings that will
24 support future dividends and share prices.

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2 **Q. Is there any empirical evidence documenting the importance of**
3 **earnings in evaluating investors' expectations in the investment**
4 **community?**

5 A. Yes, there is an abundance of evidence attesting to the importance of
6 earnings in assessing investors' expectations. First, the sheer volume of
7 earnings forecasts available from the investment community relative to the
8 scarcity of dividend forecasts attests to their importance. To illustrate,
9 Value Line, Zacks Investment, First Call Thompson, Yahoo Finance, and
10 Multex provide comprehensive compilations of investors' earnings
11 forecasts, to name some. The fact that these investment information
12 providers focus on growth in earnings rather than growth in dividends
13 indicates that the investment community regards earnings growth as a
14 superior indicator of future long-term growth. Second, surveys of analytical
15 techniques actually used by analysts reveal the dominance of earnings and
16 conclude that earnings are considered far more important than dividends.
17 Third, Value Line's principal investment rating assigned to individual stocks,
18 Timeliness Rank, is based primarily on earnings, accounting for 65% of the
19 ranking.

20
21 **Q. Please describe your first proxy group for the Company's vertically**
22 **integrated electric utility business?**

23 A. As a first proxy for the Company's vertically integrated electric utility
24 business, I examined a group of investment-grade utilities designated as

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1 “integrated” utilities by S&P in a recent comprehensive analysis of utility
2 business risks. The original group is shown on Pages 1 - 3 of Exhibit DE-
3 12, Schedule D4-4, and includes electricity and natural gas utility operating
4 companies engaged in predominantly integrated utility activities. Foreign
5 companies, private partnerships, private companies, and companies below
6 investment-grade, that is, companies with a bond rating below Baa3, were
7 eliminated as well as those companies without Value Line coverage. Pages
8 4 through 6 of Exhibit DE-12, Schedule D4-4 narrows the group down to
9 include only the parent companies of investment-grade vertically integrated
10 electric utility utilities. Two companies whose market capitalization was less
11 than \$500 million (Central Vermont, Green Mountain Power) were also
12 eliminated in order to minimize any stock price anomalies due to thin
13 trading. The remaining sample of 38 companies is made up of the parent
14 company of these electric utility companies as shown on Page 7 of Exhibit
15 DE-12, Schedule D4-4. The final group of 26 companies (Page 8) only
16 includes those companies with at least 50% of their revenues from
17 regulated electric utility operations. The same group was discussed earlier
18 in connection with beta estimates and is retained for the DCF analysis.

19

20 **Q. What DCF results did you obtain for the vertically integrated electric**
21 **utility group using Value Line growth projections?**

22 A. For purposes of conducting the DCF analysis, as shown on Page 1 of
23 Exhibit DE-12, Schedule D4-5, two companies (Allete, and Progress
24 Energy) for which no growth forecast was available were discarded. One

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1 non-dividend paying company, El Paso Electric, was discarded also. PG&E
2 was eliminated on account of its extraordinary outlying growth rate.

3 As shown on Column c, line 23 of page 2 of Exhibit DE-12, Schedule
4 D4-5, the average long-term growth forecast obtained from Value Line is
5 5.7% for this group. Adding this growth rate to the average expected
6 dividend yield of 4.3% shown in Column d produces an estimate of equity
7 costs of 10.0% for the group. Recognition of flotation costs brings the cost
8 of equity estimate to 10.2%, shown in Column f.

9

10 **Q. What DCF results did you obtain for the vertically integrated electric**
11 **utility group using the analysts' consensus growth forecast?**

12 A. From the original sample of 25 companies shown on page 1 of Exhibit DE-
13 12, Schedule D4-6, Empire District and MGE Energy were eliminated as no
14 analysts' growth forecasts were available from Zacks. One non-dividend
15 paying company, El Paso Electric, was discarded also. For the remaining
16 22 companies shown on page 2 of Exhibit DE-12, Schedule D4-6, using the
17 consensus analysts' earnings growth forecast published by Zacks of 5.8%
18 instead of the Value Line forecast, the cost of equity for the group is 10.1%
19 unadjusted for flotation cost. Recognition of flotation costs brings the cost
20 of equity estimate to 10.3%, shown in Column f, line 23, virtually the same
21 result obtained using the Value Line growth forecasts.

22

23 **Q. What DCF results did you obtain for DECo's parent company?**

24 A. The DCF results for DECo's parent company can be gleaned from Exhibits

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1 DE-12, Schedule's D4-5 and D4-6. As shown at the bottom of Exhibit DE-
2 12, Schedule D4-6 Page 2, Column c, the long-term growth forecast
3 obtained from the Zacks corporate earnings database is 5.5% for DTE.
4 Combining this growth rate with the expected dividend yield of 5.3% shown
5 in Column d produces an estimate of equity costs of 10.8%. Recognition of
6 flotation costs brings the cost of equity estimate to 11.1%, shown in Column
7 f.

8 Repeating the exact same procedure, only this time using Value Line's
9 long-term earnings growth forecast of 6.5% instead of the Zacks consensus
10 growth forecast, the cost of equity for DTE is 11.8%, unadjusted for flotation
11 costs. Adding an allowance for flotation costs brings the cost of equity
12 estimate to 12.1%. This analysis is displayed at the bottom of Exhibit DE-
13 12, Schedule D4-5, Page 2.

14

15 **Q. What DCF results did you obtain for Moody's Electric Utilities Group?**

16 A. Page 1 of Exhibit DE-12, Schedule D4-7 displays the electric utilities that
17 make up Moody's Electric Utility Index. Progress Energy for which no
18 growth forecast was available was eliminated from the group, along with
19 DPL Inc on account of its outlying DCF estimate which was far less than the
20 cost of debt. Public Service Enterprise Group and Cinergy were discarded
21 on account of ongoing merger activity. As shown on Column c of page 2 of
22 Exhibit DE-12, Schedule D4-7, the average long-term growth forecast
23 obtained from Value Line is 5.9% for this group. Adding this growth rate to
24 the average expected dividend yield of 4.4% shown in Column d for each

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1 company produces an estimate of equity costs of 10.4% for the group,
2 unadjusted for flotation costs. Adding an allowance for flotation costs to the
3 results of Column e brings the cost of equity estimate to 10.6%, shown in
4 Column f.

5 Using the consensus analysts' growth forecast from Zacks instead of
6 the Value Line growth forecast, the cost of equity for the Moody's group is
7 10.4%. This analysis is displayed on Pages 1 and 2 of Exhibit DE-12,
8 Schedule D4-8. No growth projections were available for CH Energy and
9 Duquesne Light, and those companies were therefore eliminated from the
10 group. Public Service Enterprise and Cinergy were also discarded on
11 account of ongoing merger activity.

12

13 **Q. Do these DCF results understate the cost of equity for DECo?**

14 A. Yes, they do. Application of the standard DCF model produces estimates
15 of common equity cost that are consistent with investors' expected return
16 only when stock prices and book values are reasonably similar, that is,
17 when the Market-to-Book ("M/B") ratio is close to unity. As shown below,
18 application of the standard DCF model to utility stocks understates the
19 investor's expected return when the M/B ratio of a given stock exceeds
20 unity. This is particularly relevant in the current capital market
21 environment where electric utility stocks are trading at M/B ratios well
22 above unity and have been for two decades. The converse is also true,
23 that is, the DCF model overstates the investor's return when the stock's
24 M/B ratio is less than unity. The reason for the distortion is that the DCF

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1 market return is applied to a book value rate base by the regulator, that is,
2 a utility's earnings are limited to earnings on a book value rate base.

3

4 **Q. Can you illustrate the effect of the M/B ratio on the DCF model by**
5 **means of a simple example?**

6 A. Yes. The simple numerical illustration shown in the table below
7 demonstrates the result of applying a market value cost rate to a book
8 value rate base under three different M/B scenarios. The three columns
9 correspond to three M/B situations: the stock trades below, equal to, and
10 above book value, respectively. The last situation (shaded portion of the
11 table) is noteworthy and representative of the current capital market
12 environment. The DCF cost rate of 10%, made up of a 5% dividend yield
13 and a 5% growth rate, is applied to the book value rate base of \$50 to
14 produce \$5.00 of earnings. Of the \$5.00 of earnings, the full \$5.00 is
15 required for dividends to produce a dividend yield of 5% on a stock price
16 of \$100.00, and no dollars are available for growth. The investor's return
17 is therefore only 5% versus his required return of 10%. A DCF cost rate of
18 10%, which implies \$10.00 of earnings, translates to only \$5.00 of
19 earnings on book value, a 5% return.

20 The situation is reversed in the first column when the stock trades
21 below book value. The \$5.00 of earnings is more than enough to satisfy
22 the investor's dividend requirements of \$1.25, leaving \$3.75 for growth, for
23 a total return of 20%. This is because the DCF cost rate is applied to a
24 book value rate base well above the market price.

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1 Therefore, the DCF cost rate understates the investor's required
2 return when stock prices are well above book, as is the case presently and
3 has been for several years, and understates the cost of common equity
4 capital.

5

6

Effect of M/B Ratio on Market Return

	<u>CASE 1</u>	<u>CASE 2</u>	<u>CASE 3</u>
1 Initial purchase price	\$25.00	\$50.00	\$100.00
2 Initial book value	\$50.00	\$50.00	\$50.00
3 Initial M/B	0.50	1.00	2.00
4 DCF Return 10% = 5% + 10.00% 5%	10.00%	10.00%	10.00%
5 Dollar Return	\$5.00	\$5.00	\$5.00
6 Dollar Dividends 5% Yield	\$1.25	\$4.00	\$4.00
7 Dollar Growth 5% Growth	\$3.75	\$1.00	\$1.00
8 Market Return	20.00%	10.00%	5.00%

7

8

9

E. NEED FOR FLOTATION COST ADJUSTMENT

10 **Q. Please describe the need for a flotation cost allowance.**

11 A. All the market-based estimates reported above include an adjustment for
12 flotation costs. The simple fact of the matter is that common equity capital
13 is not free. Flotation costs associated with stock issues are exactly like the
14 flotation costs associated with bonds and preferred stocks. Flotation costs
15 are not expensed at the time of issue, and therefore must be recovered via
16 a rate of return adjustment. This is done routinely for bond and preferred
17 stock issues by most regulatory commissions, including FERC. Clearly, the
18 common equity capital accumulated by the Company is not cost-free. The
19 flotation cost allowance to the cost of common equity capital is discussed

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1 and applied in most corporate finance textbooks; it is unreasonable to
2 ignore the need for such an adjustment.

3 Flotation costs are very similar to the closing costs on a home
4 mortgage. In the case of issues of new equity, flotation costs represent the
5 discounts that must be provided to place the new securities. Flotation costs
6 have a direct and an indirect component. The direct component is the
7 compensation to the security underwriter for his marketing/consulting
8 services, for the risks involved in distributing the issue, and for any
9 operating expenses associated with the issue (printing, legal, prospectus,
10 etc.). The indirect component represents the downward pressure on the
11 stock price as a result of the increased supply of stock from the new issue.
12 The latter component is frequently referred to as "market pressure."

13 Investors must be compensated for flotation costs on an ongoing basis
14 to the extent that such costs have not been expensed in the past, and
15 therefore the adjustment must continue for the entire time that these initial
16 funds are retained in the firm. Appendix C to my testimony discusses
17 flotation costs in detail, and shows: (1) why it is necessary to apply an
18 allowance of 5% to the dividend yield component of equity cost by dividing
19 that yield by 0.95 (100% - 5%) to obtain the fair return on equity capital; (2)
20 why the flotation adjustment is permanently required to avoid confiscation
21 even if no further stock issues are contemplated; and (3) that flotation costs
22 are only recovered if the rate of return is applied to total equity, including
23 retained earnings, in all future years.

24 By analogy, in the case of a bond issue, flotation costs are not

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1 expensed but are amortized over the life of the bond, and the annual
2 amortization charge is embedded in the cost of service. The flotation
3 adjustment is also analogous to the process of depreciation, which allows
4 the recovery of funds invested in utility plant. The recovery of bond flotation
5 expense continues year after year, irrespective of whether the Company
6 issues new debt capital in the future, until recovery is complete, in the same
7 way that the recovery of past investments in plant and equipment through
8 depreciation allowances continues in the future even if no new construction
9 is contemplated. In the case of common stock that has no finite life,
10 flotation costs are not amortized. Thus, the recovery of flotation cost
11 requires an upward adjustment to the allowed return on equity.

12 A simple example will illustrate the concept. A stock is sold for \$100,
13 and investors require a 10% return, that is, \$10 of earnings. But if flotation
14 costs are 5%, the Company nets \$95 from the issue, and its common equity
15 account is credited by \$95. In order to generate the same \$10 of earnings
16 to the shareholders, from a reduced equity base, it is clear that a return in
17 excess of 10% must be allowed on this reduced equity base, here 10.52%.

18 According to the empirical finance literature discussed in Appendix C,
19 total flotation costs amount to 4% for the direct component and 1% for the
20 market pressure component, for a total of 5% of gross proceeds. This in
21 turn amounts to approximately 30 basis points, depending on the
22 magnitude of the dividend yield component. To illustrate, dividing the
23 average expected dividend yield of around 5.0% for utility stocks by 0.95
24 yields 5.3%, which is 30 basis points higher.

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1 Sometimes, the argument is made that flotation costs are real and
2 should be recognized in calculating the fair return on equity, but only at the
3 time when the expenses are incurred. In other words, the flotation cost
4 allowance should not continue indefinitely, but should be made in the year
5 in which the sale of securities occurs, with no need for continuing
6 compensation in future years. This argument is valid only if the Company
7 has already been compensated for these costs. If not, the argument is
8 without merit. My own recommendation is that investors be compensated
9 for flotation costs on an on-going basis rather than through expensing, and
10 that the flotation cost adjustment continue for the entire time that these
11 initial funds are retained in the firm.

12 There are several sources of equity capital available to a firm including:
13 common equity issues, conversions of convertible preferred stock, dividend
14 reinvestment plan, employees' savings plan, warrants, and stock dividend
15 programs. Each carries its own set of administrative costs and flotation
16 cost components, including discounts, commissions, corporate expenses,
17 offering spread, and market pressure. The flotation cost allowance is a
18 composite factor that reflects the historical mix of sources of equity. The
19 allowance factor is a build-up of historical flotation cost adjustments
20 associated and traceable to each component of equity at its source. It is
21 impractical and prohibitively costly to start from the inception of a company
22 and determine the source of all present equity. A practical solution is to
23 identify general categories and assign one factor to each category. My
24 recommended flotation cost allowance is a weighted average cost factor

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1 designed to capture the average cost of various equity vintages and types
2 of equity capital raised by the Company.

3

4 **Q. Is a flotation cost adjustment required for an operating subsidiary like**
5 **DECo that does not trade publicly?**

6 A. Yes, it is. It is sometimes alleged that a flotation cost allowance is
7 inappropriate if the utility is a subsidiary whose equity capital is obtained
8 from its ultimate parent, in this case, DTE Energy. This objection is
9 unfounded since the parent-subsidary relationship does not eliminate the
10 costs of a new issue, but merely transfers them to the parent. It would be
11 unfair and discriminatory to subject parent shareholders to dilution while
12 individual shareholders are absolved from such dilution. Fair treatment
13 must consider that, if the utility-subsidary had gone to the capital markets
14 directly, flotation costs would have been incurred.

15

16 **III. SUMMARY AND RECOMMENDATION ON COST OF EQUITY**

17 **Q. Please summarize your results and recommendation.**

18 A. To arrive at my final recommendation, I performed four risk premium
19 analyses. For the first two risk premium studies, I applied the CAPM and
20 an empirical approximation of the CAPM using current market data. The
21 other two risk premium analyses were performed on historical and allowed
22 risk premium data from electric utility industry aggregate data, using the
23 current and forecast yields on long-term Treasury bonds. I also performed
24 DCF analyses on three surrogates for DECo: the parent company, a group

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of vertically integrated electric utilities, and a group of companies that make up Moody's Electric Utility Index. The results are summarized in the table below.

	STUDY	ROE
	CAPM	11.7%
	Empirical CAPM	12.0%
	Risk Premium Electric Utility	10.9%
	Allowed Risk Premium	10.9%
	DCF Integrated Elec Utility Zacks Growth	10.3%
	DCF Integrated Elec Utility Value Line Growth	10.2%
	DCF DTE Energy Value Line Growth	11.1%
	DCF DTE Energy Zacks Growth	12.1%
	DCF Moody's Electrics Zacks Growth	10.4%
	DCF Moody's Electrics Value Line Growth	10.6%

The results range from a low of 10.2% to a high of 12.1%, with a midpoint of 11.2%. Yet another way of presenting the results is on a methodological basis. The average result from the three principal methodologies is as follows:

	CAPM	11.9%
	Risk Premium	10.9%
	DCF	<u>10.8%</u>
	AVERAGE	11.2%

The overall average result is 11.2%, and the various results are closely clustered around 11.2%. Placing slightly less weight on the DCF results, the central result is 11.25%. I stress that no one individual method provides an exclusive foolproof formula for determining a fair return, but each method provides useful evidence so as to facilitate the exercise of an informed judgment. Reliance on any single method or preset formula is hazardous when dealing with investor expectations. Moreover, the advantage of using

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1 several different approaches is that the results of each one can be used to
2 check the others. Thus, the results shown in the above table must be
3 viewed as a whole rather than each as a stand-alone. It would be
4 inappropriate to select any particular number from the summary table and
5 infer DECo's equity costs from that number alone.

6

7 **Q. Dr. Morin, what is your final conclusion regarding DECo's cost of**
8 **equity capital?**

9 A. Based on the results of all my analyses and the application of my
10 professional judgment, it is my opinion that a just and reasonable return on
11 common equity is 11.25%. As I stated earlier in my testimony, given the
12 riskier environment facing DECo, compared to other utilities, the 11.25% is
13 dependent on whether DECo's electric choice tracker mechanism is
14 approved by the Commission. Without such a tracker mechanism, DECo's
15 market risk increases, and thus I would recommend a 11.50% return on
16 common equity.

17

18 **Q. Is there a relationship between financial risk and the authorized return**
19 **on equity?**

20 A. There certainly is. A low authorized return on equity increases the
21 likelihood the utility will have to rely increasingly on debt financing for its
22 capital needs. This creates the specter of a spiraling cycle that further
23 increases risks to both equity and debt investors; the resulting increase in
24 financing costs is ultimately borne by the utility's customers through higher

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1 capital costs and rates of returns.

2

3 **Q. What capital structure assumption underlies your recommended**
4 **return on DECo's common equity capital?**

5 A. My recommended return on common equity for DECo is predicated on the
6 adoption of the Company's test year capital structure consisting of 50%
7 common equity capital. Should the Commission decide to deviate from the
8 capital structure, empirical finance literature demonstrates that with each
9 reduction in common equity ratio of 1%, the return on equity increases by
10 approximately 10 basis points, and conversely of course.

11

12 **Q. Did you examine the reasonableness of the Company's test year**
13 **capital structure?**

14 A. Yes, I did. I have compared DECo's test year capital structure with the
15 capital structures of comparable risk investor-owned vertically integrated
16 electric utilities. As shown on Exhibit DE-12, Schedule D4-9, the average
17 common equity ratio of comparable risk investment-grade integrated
18 electric utilities, the same group of companies used earlier in my testimony
19 when applying the DCF model, is 48.5% which is very close to the
20 Company's test year capital structure.

21 I have also compared the Company's test year common equity ratio of
22 50% to the capital structure benchmark contained in Standard and Poor's
23 ("S&P") Rating Criteria for electric utilities. DECo is assigned a Business

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1 Risk Position of 6.0 by S&P on a scale of 1.0 to 10.0, with 1.0 being the
2 least risky and 10.0 the most risky. For a utility with a Business Risk
3 Position of 6.0, the debt ratio benchmark for a single “A” bond rating, which
4 I consider optimal for both ratepayers and utility investors, is 40% – 48%,
5 that is, an equity benchmark of 52% - 60% versus the Company’s 50%
6 common equity. The Company’s common equity ratio lies outside the
7 range for a single “A” bond rating. The benchmark for a BBB bond rating is
8 48% – 58%, that is, an equity benchmark of 42% - 52% versus the
9 Company’s 50% common equity. For a BBB bond rating, the Company’s
10 common equity ratio lies very close to the midpoint of the range.

11 If the Commission imputes a capital structure consisting of
12 substantially more or (less) debt than the test year capital structure, the
13 higher or (lower) common equity cost rate related to a changed common
14 equity ratio should be reflected in the approach. If the Commission
15 ascribes a capital structure different from the test year capital structure,
16 which imputes a higher debt amount for example, the repercussions on
17 equity costs must be recognized. It is a rudimentary tenet of basic finance
18 that the greater the amount of financial risk borne by common shareholders,
19 the greater the return required by shareholders in order to be compensated
20 for the added financial risk imparted by the greater use of senior debt
21 financing. In other words, the greater the debt ratio, the greater is the
22 return required by equity investors. Both the cost of incremental debt and
23 the cost of equity must be adjusted to reflect the additional risk associated

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1 with the more debt-heavy capital structure. Lower common equity ratios
2 imply greater risk and higher capital cost, and conversely.

3

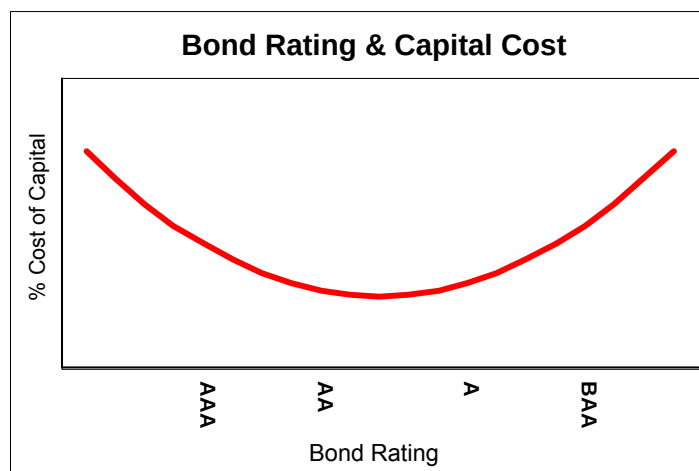
4 **Q. Dr. Morin, you mentioned earlier the need for an optimal bond rating**
5 **of single A. Could you elaborate on that point?**

6 A. It is in both ratepayers' and investors' interest that a regulated utility be
7 financially sound and have the credit rating and financial flexibility needed
8 to (1) cope with the increased operational challenges in today's much more
9 volatile industry environment; (2) pursue initiatives to further increase
10 performance, and (3) finance in a timely and cost effective fashion the
11 significant infrastructure investment needs faced in DECo's service territory.

12 In the utility regulation context, the idea of an optimal strong "A" bond
13 rating for a utility's senior securities is widely supported. That is why the
14 vast majority of utilities in North America migrate to such a bond rating.

15 I have performed several studies and I have frequently testified on the
16 optimal capital structure for various utilities. One common theme in these
17 studies and testimonies is the desirability of a strong "A" bond rating from
18 both the ratepayers' and investors' standpoint. Chapter 19 of my book
19 Regulatory Finance describes a capital structure simulation model for
20 electric utilities using market data prior to industry restructuring. The graph
21 below illustrates the major finding of the model, and demonstrates how the
22 cost of capital changes as the debt ratio increases and the bond rating
23 declines.

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The horizontal axis shows that as the company substitutes debt for equity, the bond rating progressively deteriorates from “AAA” all the way down to “BAA” and beyond. The vertical axis shows what happens to overall capital costs, hence to rates, as the company continues to substitute debt for equity and its bond rating deteriorates. With each successive substitution of lower-cost debt for higher-cost equity, the average cost of capital declines as the weight of low-cost debt in the weighted average cost of capital increases. An optimal point is reached where the cost advantage of debt is exactly offset by the increased cost of equity. This is the optimal capital structure point. Beyond that point, the cost disadvantage of equity outweighs the cost advantage of debt, and the weighted cost of capital rises accordingly. The message from the graph is clear: over the long run, a strong “A” bond rating will minimize the cost of capital to ratepayers.

Several intangible costs and distress costs associated with a low bond rating cannot be readily accommodated into a mathematical simulation model without the model becoming computationally prohibitive. Thus, the

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1 case for a strong “A” bond rating is understated in these studies. Several
2 examples of such costs follow.

3 The need to maintain borrowing capacity is well known. During normal
4 times, a utility company should conserve enough unused borrowing
5 capacity so that during adverse capital market periods it can use this
6 capacity to avoid foregoing investment opportunities, selling stock at
7 confiscatory prices, or jeopardizing its mandated obligation to serve. The
8 yield advantage of a higher bond rating increases dramatically in adverse
9 capital market conditions.

10 Bond flotation costs, which must be borne by ratepayers, increase also
11 as bond ratings decline, particularly in years of difficult financial markets.
12 Not only is lower bond quality associated with higher yields, but lower-rated
13 utility bonds also carry shorter maturities, especially in poor years. The
14 result is a maturity mismatch between the firm's long-term capital assets
15 and its liabilities. Moreover, lower bond quality is associated with more
16 years of call protection, particularly during difficult financial markets; since
17 bonds are frequently called after a decrease in interest rates, bonds which
18 carry call protection for a greater number of years are more costly to utility
19 companies. Finally, as bond ratings decline, the probability that a company
20 will reduce the dollar amount or shorten the maturity of their bond issues
21 increases dramatically; this in turn reduces the marketability of a bond
22 issue, and hence increases its yield. Any reasonable quantification of such
23 implicit costs reinforces the case for a strong “A” rating.

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1 The implication for DECo is very clear. Long-term achievement and
2 maintenance of a strong “A” rating is in investors’ and ratepayers’ best
3 interests. Capital structure targets should be therefore set so as to achieve
4 such ratings.

5

6 **Q. Dr. Morin, in light of your discussion of an optimal bond rating, what**
7 **are your thoughts regarding DECo’s capital structure?**

8 A. Long-term achievement and maintenance of a strong “A” rating is in
9 investors’ and ratepayers’ best interests. Capital structure targets should
10 be therefore set so as to achieve such ratings. In addition, although the
11 legal definition of investment grade is “BBB”, the actual practical definition
12 of investment grade is “A”. This is because a large majority of institutional
13 investors are precluded from investing in bonds rated below “A”. For all
14 these reasons, sound public policy requires that the Commission establish
15 rates so as to create financial conditions conducive to an optimal bond
16 rating of at least single “A”.

17 As discussed earlier, the Company’s financial condition is not
18 consistent with a single “A” credit rating. In light of DECo’s capital
19 expenditure requirements and the critical importance of preserving access
20 to capital markets, DECo’s long-term goal is to achieve strong single “A”
21 credit ratings. Consequently, DECo’s credit profile with the two major credit
22 rating agencies needs to improve in order to support an upgrade from its
23 current unsecured rating levels to a Single “A” rated level. This goal implies
24 continued improvement in reducing debt, reducing interest expense and

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1 increasing cash flows.

2 The existence of a strong equity base favorably impacts the cost of
3 debt by virtue of superior credit ratings, allows the company to absorb
4 operating deficits without violating debt servicing obligations, and provides
5 flexibility and freedom in timing new debt issues in that capital can be raised
6 with discretion under favorable capital market conditions.

7

8 **Q. Finally, Dr. Morin, if capital market conditions change significantly**
9 **between the date of filing your prepared testimony and the date your**
10 **oral testimony is presented, would this cause you to revise your**
11 **estimated cost of equity?**

12 A. Yes. Interest rates and security prices do change over time, and risk
13 premiums change also, although much more sluggishly. If substantial
14 changes were to occur between the filing date and the time my oral
15 testimony is presented, I will update my testimony accordingly.

16

17 **Q. Does this complete your testimony?**

18 A. Yes, it does.

19

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Commission's own motion)
ordering **THE DETROIT EDISON COMPANY**)
to show cause why its retail rates for the sale)
and distribution of electric energy should not)
be decreased.)

Case No. U-14838

EXHIBITS
OF
DR. ROGER A. MORIN

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Commission's own motion)
ordering **THE DETROIT EDISON COMPANY**)
to show cause why its retail rates for the sale)
and distribution of electric energy should not)
be decreased.)

Case No. U-14838

WORKPAPERS
OF
DR. ROGER A. MORIN

APPENDIX A
RESUME OF DR. ROGER A MORIN

NAME: Roger A. Morin

ADDRESS: 9 King Ave.
Jekyll Island, GA 31527, USA

TELEPHONE: (912) 635-3233 business office
(912) 635-3233 business fax
(404) 229-2857 cellular
(404) 651-2674 office-university

E-MAIL ADDRESS: profmorin@msn.com

DATE OF BIRTH: 3/5/1945

PRESENT EMPLOYER: Georgia State University
Robinson College of Business
Atlanta, GA 30303

RANK: Professor of Finance

HONORS: Professor of Finance for Regulated Industry
Director Center for the Study of Regulated Industry,
College of Business, Georgia State University.

EDUCATIONAL HISTORY

- Bachelor of Electrical Engineering, McGill University,
Montreal, Canada, 1967.
- Master of Business Administration, McGill University,
Montreal, Canada, 1969.
- PhD in Finance & Econometrics, Wharton School of Finance,
University of Pennsylvania, 1976.

EMPLOYMENT HISTORY

- Lecturer, Wharton School of Finance, Univ. of Pa., 1972-3
- Assistant Professor, University of Montreal School of

APPENDIX A RESUME OF DR. ROGER A MORIN

Business, 1973-1976.

- Associate Professor, University of Montreal School of Business, 1976-1979.
- Professor of Finance, Georgia State University, 1979-2005
- Professor of Finance for Regulated Industry and Director, Center for the Study of Regulated Industry, College of Business, Georgia State University, 1985-2005
- Visiting Professor of Finance, Amos Tuck School of Business, Dartmouth College, Hanover, N.H., 1986

OTHER BUSINESS ASSOCIATIONS

- Communications Engineer, Bell Canada, 1962-1967.
- Member of the Board of Directors, Financial Research Institute of Canada, 1974-1980.
- Co-founder and Director Canadian Finance Research Foundation, 1977.
- Vice-President of Research, Garmaise-Thomson & Associates, Investment Management Consultants, 1980-1981.
- Executive Visions Inc., Board of Directors, Member
- Board of External Advisors, College of Business, Georgia State University, Member 1987-1991

APPENDIX A
RESUME OF DR. ROGER A MORIN

PROFESSIONAL CLIENTS

AGL Resources

AT & T Communications

Alagasco - Energen

Alaska Anchorage Municipal Light & Power

Alberta Power Ltd.

Ameren

American Water Works Company

Ameritech

Arkansas Western Gas

Baltimore Gas & Electric – Constellation Energy

B.C. Telephone

B C GAS

Bell Canada

Bellcore

Bell South Corp.

Bruncor (New Brunswick Telephone)

Burlington-Northern

C & S Bank

Cajun Electric

Canadian Radio-Television & Telecomm. Commission

Canadian Utilities

Canadian Western Natural Gas

Cascade Natural Gas

Centel

Centra Gas

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RESUME OF DR. ROGER A MORIN

Central Illinois Light & Power Co.

PROFESSIONAL CLIENTS (CONT'D)

Central Telephone

Central & South West Corp.

Chattanooga Gas Company

Cincinnati Gas & Electric

Cinergy Corp.

Citizens Utilities

City Gas of Florida

CN-CP Telecommunications

Commonwealth Telephone Co.

Columbia Gas System

Consolidated Natural Gas

Constellation Energy

Delmarva Power & Light Co

Deerpath Group

Edison International

Edmonton Power Company

Elizabethtown Gas Co.

Energen

Engraph Corporation

Entergy Corp.

Entergy Arkansas Inc.

Entergy Gulf States, Inc.

Entergy Louisiana, Inc.

Entergy New Orleans, Inc.

APPENDIX A
RESUME OF DR. ROGER A MORIN

First Energy

Florida Water Association

PROFESSIONAL CLIENTS (CONT'D)

Fortis

Garmaise-Thomson & Assoc., Investment Consultants

Gaz Metropolitain

General Public Utilities

Georgia Broadcasting Corp.

Georgia Power Company

GTE California - Verizon

GTE Northwest Inc. - Verizon

GTE Service Corp. - Verizon

GTE Southwest Incorporated - Verizon

Gulf Power Company

Havasu Water Inc.

Hawaiian Electric Company

Heater Utilities – Aqua - America

Hope Gas Inc.

Hydro-Quebec

ICG Utilities

Illinois Commerce Commission

Island Telephone

Jersey Central Power & Light

Kansas Power & Light

KeySpan Energy

Manitoba Hydro

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RESUME OF DR. ROGER A MORIN

Maritime Telephone

Metropolitan Edison Co.

Minister of Natural Resources Province of Quebec

PROFESSIONAL CLIENTS (CONT'D)

Minnesota Power & Light

Mississippi Power Company

Missouri Gas Energy

Mountain Bell

Nevada Power Company

New Brunswick Power

Newfoundland Power Inc. - Fortis Inc.

New Tel Enterprises Ltd.

New York Telephone Co.

Norfolk-Southern

Northeast Utilities

Northern Telephone Ltd.

Northwestern Bell

Northwestern Utilities Ltd.

Nova Scotia Power – Emera Inc.

Nova Scotia Utility and Review Board

NUI Corp.

NYNEX

Oklahoma G & E

Ontario Telephone Service Commission

Orange & Rockland

Pacific Northwest Bell

APPENDIX A
RESUME OF DR. ROGER A MORIN

People's Gas System Inc.

People's Natural Gas

Pennsylvania Electric Co.

Pepco Holdings

PROFESSIONAL CLIENTS (CONT'D)

Price Waterhouse

PSI Energy

Public Service Electric & Gas

Public Service of New Hampshire

Puget Sound Electric Co.

Quebec Telephone

Regie de l'Energie du Quebec

Rochester Telephone

San Diego Gas & Electric

SaskPower

Sierra Pacific Power Company

Southern Bell

Southern States Utilities

Southern Union Gas

South Central Bell

Sun City Water Company

TECO Energy

The Southern Company

Touche Ross and Company

TransEnergie

Trans-Quebec & Maritimes Pipeline

APPENDIX A
RESUME OF DR. ROGER A MORIN

TXU Corp

US WEST Communications

Union Heat Light & Power

Utah Power & Light

Vermont Gas Systems Inc.

MANAGEMENT DEVELOPMENT AND PROFESSIONAL EXECUTIVE EDUCATION

- Canadian Institute of Marketing, Corporate Finance, 1971-73
- Hydro-Quebec, "Capital Budgeting Under Uncertainty," 1974-75
- Institute of Certified Public Accountants, Mergers & Acquisitions, 1975-78
- Investment Dealers Association of Canada, 1977-78
- Financial Research Foundation, bi-annual seminar, 1975-79
- Advanced Management Research (AMR), faculty member, 1977-80
- Financial Analysts Federation, Educational chapter: "Financial Futures Contracts" seminar
- Exnet Inc. a.k.a. The Management Exchange Inc., faculty member 1981-2006
National Seminars:

Risk and Return on Capital Projects

Cost of Capital for Regulated Utilities

Capital Allocation for Utilities

Alternative Regulatory Frameworks

Utility Directors' Workshop

Shareholder Value Creation for Utilities

Real Options in Utility Capital Investments

Fundamentals of Utility Finance in a Restructured Environment

Contemporary Issues in Utility Finance

- Georgia State University College of Business, Management Development Program, faculty member, 1981-1994

EXPERT TESTIMONY & UTILITY CONSULTING AREAS OF EXPERTISE

Rate of Return

APPENDIX A RESUME OF DR. ROGER A MORIN

Capital Structure

Generic Cost of Capital

Costing Methodology

Depreciation

Flow-Through vs Normalization

Revenue Requirements Methodology

Utility Capital Expenditures Analysis

Risk Analysis

Capital Allocation

Divisional Cost of Capital, Unbundling

Incentive Regulation & Alternative Regulatory Plans

Shareholder Value Creation

Value-Based Management

REGULATORY BODIES

Federal Communications Commission

Federal Energy Regulatory Commission

Georgia Public Service Commission

South Carolina Public Service Commission

North Carolina Utilities Commission

Pennsylvania Public Service Commission

Ontario Telephone Service Commission

Quebec Telephone Service Commission

Newfoundland Board of Commissioners of Public Utilities

Georgia Senate Committee on Regulated Industries

Alberta Public Service Board

Tennessee Regulatory Authority

APPENDIX A
RESUME OF DR. ROGER A MORIN

Oklahoma State Board of Equalization

Mississippi Public Service Commission

Minnesota Public Utilities Commission

Canadian Radio-Television & Telecommunications Comm.

New Brunswick Board of Public Commissioners

Alaska Public Utility Commission

National Energy Board of Canada

Florida Public Service Commission

Montana Public Service Commission

Arizona Corporation Commission

Quebec Natural Gas Board

Quebec Regie de l'Energie

New York Public Service Commission

Washington Utilities & Transportation Commission

Manitoba Board of Public Utilities

New Jersey Board of Public Utilities

Alabama Public Service Commission

Utah Public Service Commission

Nevada Public Service Commission

Louisiana Public Service Commission

Colorado Public Utilities Board

West Virginia Public Service Commission

Ohio Public Utilities Commission

California Public Service Commission

Hawaii Public Service Commission

Illinois Commerce Commission

APPENDIX A
RESUME OF DR. ROGER A MORIN

British Columbia Board of Public Utilities

Indiana Utility Regulatory Commission

Minnesota Public Utilities Commission

Texas Public Utility Commission

Michigan Public Service Commission

Iowa Board of Public Utilities

Missouri Public Service Commission

Arkansas Public Service Commission

Hawaii Public Utility Commission

New Hampshire Public Utility Commission

Delaware Public Utility Commission

Washington Utilities & Transportation Commission

Virginia Public Service Commission

SERVICE AS EXPERT WITNESS

Southern Bell, So. Carolina PSC, Docket #81-201C

Southern Bell, So. Carolina PSC, Docket #82-294C

Southern Bell, North Carolina PSC, Docket #P-55-816

Metropolitan Edison, Pennsylvania PUC, Docket #R-822249

Pennsylvania Electric, Pennsylvania PUC, Docket #R-822250

Georgia Power, Georgia PSC, Docket # 3270-U, 1981

Georgia Power, Georgia PSC, Docket # 3397-U, 1983

Georgia Power, Georgia PSC, Docket # 3673-U, 1987

Georgia Power, F.E.R.C., Docket # ER 80-326, 80-327

Georgia Power, F.E.R.C., Docket # ER 81-730, 80-731

Georgia Power, F.E.R.C., Docket # ER 85-730, 85-731

Bell Canada, CRTC 1987

APPENDIX A
RESUME OF DR. ROGER A MORIN

Northern Telephone, Ontario PSC
GTE-Quebec Telephone, Quebec PSC, Docket 84-052B
Newtel., Nfld. Brd of Public Commission PU 11-87
CN-CP Telecommunications, CRTC
Quebec Northern Telephone, Quebec PSC
Edmonton Power Company, Alberta Public Service Board
Kansas Power & Light, F.E.R.C., Docket # ER 83-418
NYNEX, FCC generic cost of capital Docket #84-800
Bell South, FCC generic cost of capital Docket #84-800
American Water Works - Tennessee, Docket #7226
Burlington-Northern - Oklahoma State Board of Taxes
Georgia Power, Georgia PSC, Docket # 3549-U
GTE Service Corp., FCC Docket #84-200
Mississippi Power Co., Miss. PSC, Docket U-4761
Citizens Utilities, Ariz. Corp. Comm., D # U2334-86020
Quebec Telephone, Quebec PSC, 1986, 1987, 1992
Newfoundland L & P, Nfld. Brd. Publ Comm. 1987, 1991
Northwestern Bell, Minnesota PSC, #P-421/CI-86-354
GTE Service Corp., FCC Docket #87-463
Anchorage Municipal Power & Light, Alaska PUC, 1988
New Brunswick Telephone, N.B. PUC, 1988
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Mountain States Bell, Montana PSC, #88-1.2
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Georgia Power, Georgia PSC, Docket # 3840-U, 1989

APPENDIX A
RESUME OF DR. ROGER A MORIN

Rochester Telephone, New York PSC, Docket # 89-C-022

Noverco - Gaz Metro, Quebec Natural Gas PSC, #R-3164-89

GTE Northwest, Washington UTC, #U-89-3031

Orange & Rockland, New York PSC, Case 89-E-175

Central Illinois Light Company, ICC, Case 90-0127

Peoples Natural Gas, Pennsylvania PSC, Case

Gulf Power, Florida PSC, Case # 891345-EI

ICG Utilities, Manitoba BPU, Case 1989

New Tel Enterprises, CRTC, Docket #90-15

Peoples Gas Systems, Florida PSC

Jersey Central Pwr & Light, N.J. PUB, Case ER 89110912J

Alabama Gas Co., Alabama PSC, Case 890001

Trans-Quebec Maritime Pipeline, Cdn. Nat'l Energy Board

Mountain Bell, Utah PSC,

Mountain Bell, Colorado PUB

South Central Bell, Louisiana PS

Hope Gas, West Virginia PSC

Vermont Gas Systems, Vermont PSC

Alberta Power Ltd., Alberta PUB

Ohio Utilities Company, Ohio PSC

Georgia Power Company, Georgia PSC

Sun City Water Company

Havas Water Inc.

Centra Gas (Manitoba) Co.

Central Telephone Co. Nevada

AGT Ltd., CRTC 1992

APPENDIX A
RESUME OF DR. ROGER A MORIN

BC GAS, BCPUB 1992

California Water Association, California PUC 1992

Maritime Telephone 1993

BCE Enterprises, Bell Canada, 1993

Citizens Utilities Arizona gas division 1993

PSI Resources 1993-5

CILCORP gas division 1994

GTE Northwest Oregon 1993

Stentor Group 1994-5

Bell Canada 1994-1995

PSI Energy 1993, 1994, 1995, 1999

Cincinnati Gas & Electric 1994, 1996, 1999, 2004

Southern States Utilities, 1995

CILCO 1995, 1999, 2001

Commonwealth Telephone 1996

Edison International 1996, 1998

Citizens Utilities 1997

Stentor Companies 1997

Hydro-Quebec 1998

Entergy Gulf States Louisiana 1998, 1999, 2001, 2002, 2003

Detroit Edison, 1999, 2003

Entergy Gulf States, Texas, 2000, 2004

Hydro Quebec TransEnergie, 2001, 2004

Sierra Pacific Company, 2000, 2001, 2002

Nevada Power Company, 2001

Mid American Energy, 2001, 2002

APPENDIX A RESUME OF DR. ROGER A MORIN

Entergy Louisiana Inc. 2001, 2002, 2004

Mississippi Power Company, 2001, 2002

Oklahoma Gas & Electric Company, 2002 -2003

Public Service Electric & Gas, 2001, 2002

NUI Corp (Elizabethtown Gas Company), 2002

Jersey Central Power & Light, 2002

San Diego Gas & Electric, 2002

NB Power, 2002

Entergy New Orleans, 2002

Hydro-Quebec Distribution 2002

PSI Energy 2003

Fortis – Newfoundland Power & Light 2002

Emera – Nova Scotia Power 2004

Hydro-Quebec TransEnergie 2004

Hawaiian Electric 2004

Missouri Gas Energy 2004

AGL Resources 2004

Arkansas Western Gas 2004

Public Service of New Hampshire 2005

Hawaiian Electric Company 2005

Delmarva Power & Light Company 2005

Union Heat Power & Light 2005

Puget Sound Electric Co 2006-01-16

Cascade Natural Gas 2006

PROFESSIONAL AND LEARNED SOCIETIES

APPENDIX A RESUME OF DR. ROGER A MORIN

- Engineering Institute of Canada, 1967-1972
- Canada Council Award, recipient 1971 and 1972
- Canadian Association Administrative Sciences, 1973-80
- American Association of Decision Sciences, 1974-1978
- American Finance Association, 1975-2002
- Financial Management Association, 1978-2002

ACTIVITIES IN PROFESSIONAL ASSOCIATIONS AND MEETINGS

- Chairman of meeting on "New Developments in Utility Cost of Capital", Southern Finance Association, Atlanta, Nov. 1982
- Chairman of meeting on "Public Utility Rate of Return", Southeastern Public Utility Conference, Atlanta, Oct. 1982
- Chairman of meeting on "Current Issues in Regulatory Finance", Financial Management Association, Atlanta, Oct. 1983
- Chairman of meeting on "Utility Cost of Capital", Financial Management Association, Toronto, Canada, Oct. 1984.
- Committee on New Product Development, FMA, 1985
- Discussant, "Tobin's Q Ratio", paper presented at Financial Management Association, New York, N.Y., Oct. 1986
- Guest speaker, "Utility Capital Structure: New Developments", National Society of Rate of Return Analysts 18th Financial Forum, Wash., D.C. Oct. 1986
- Opening address, "Capital Expenditures Analysis: Methodology vs Mythology," Bellcore Economic Analysis Conference, Naples Fla., 1988.

PAPERS PRESENTED:

"An Empirical Study of Multi-Period Asset Pricing," annual meeting of Financial Management Assoc., Las Vegas Nevada, 1987.

"Utility Capital Expenditures Analysis: Net Present Value vs Revenue Requirements", annual meeting of Financial Management Assoc., Denver, Colorado, October 1985.

APPENDIX A RESUME OF DR. ROGER A MORIN

"Intervention Analysis and the Dynamics of Market Efficiency", annual meeting of Financial Management Assoc., San Francisco, Oct. 1982

"Intertemporal Market-Line Theory: An Empirical Study," annual meeting of Eastern Finance Assoc., Newport, R.I. 1981

"Option Writing for Financial Institutions: A Cost-Benefit Analysis", 1979 annual meeting Financial Research Foundation

"Free-lunch on the Toronto Stock Exchange", annual meeting of Financial Research Foundation of Canada, 1978.

"Simulation System Computer Software SIMFIN", HP International Business Computer Users Group, London, 1975.

"Inflation Accounting: Implications for Financial Analysis." Institute of Certified Public Accountants Symposium, 1979.

OFFICES IN PROFESSIONAL ASSOCIATIONS

- President, International Hewlett-Packard Business Computers Users Group, 1977

- Chairman Program Committee, International HP Business Computers Users Group, London, England, 1975

- Program Coordinator, Canadian Assoc. of Administrative Sciences, 1976

- Member, New Product Development Committee, Financial Management Association, 1985-1986

- Reviewer: Journal of Financial Research

Financial Management

Financial Review

Journal of Finance

APPENDIX A RESUME OF DR. ROGER A MORIN

PUBLICATIONS

"Risk Aversion Revisited", Journal of Finance, Sept. 1983

"Hedging Regulatory Lag with Financial Futures," Journal of Finance, May 1983. (with G. Gay, R. Kolb)

"The Effect of CWIP on Cost of Capital," Public Utilities Fortnightly, July 1986.

"The Effect of CWIP on Revenue Requirements" Public Utilities Fortnightly, August 1986.

"Intervention Analysis and the Dynamics of Market Efficiency," Time-Series Applications, New York: North Holland, 1983. (with K. El-Sheshai)

"Market-Line Theory and the Canadian Equity Market," Journal of Business Administration, Jan. 1982, M. Brennan, editor

"Efficiency of Canadian Equity Markets," International Management Review, Feb. 1978.

"Intertemporal Market-Line Theory: An Empirical Test," Financial Review, Proceedings of the Eastern Finance Association, 1981.

BOOKS

Utilities' Cost of Capital, Public Utilities Reports Inc., Arlington, Va., 1984.

Regulatory Finance, Public Utilities Reports Inc., Arlington, Va., 1994.

Driving Shareholder Value, McGraw-Hill, January 2001.

The New Regulatory Finance, forthcoming February 2006.

MONOGRAPHS

Determining Cost of Capital for Regulated Industries, Public Utilities Reports, Inc., and The Management Exchange Inc., 1982 - 1993. (with V.L. Andrews)

APPENDIX A RESUME OF DR. ROGER A MORIN

Alternative Regulatory Frameworks, Public Utilities Reports, Inc., and The Management Exchange Inc., 1993. (with V.L. Andrews)

Risk and Return in Capital Projects, The Management Exchange Inc., 1980. (with B. Deschamps)

Utility Capital Expenditure Analysis, The Management Exchange Inc., 1983.

Regulation of Cable Television: An Econometric Planning Model, Quebec Department of Communications, 1978.

"An Economic & Financial Profile of the Canadian Cablevision Industry," Canadian Radio-Television & Telecommunication Commission (CRTC), 1978.

Computer Users' Manual: Finance and Investment Programs, University of Montreal Press, 1974, revised 1978.

Fiber Optics Communications: Economic Characteristics, Quebec Department of Communications, 1978.

"Canadian Equity Market Inefficiencies", Capital Market Research Memorandum, Garmaise & Thomson Investment Consultants, 1979.

MISCELLANEOUS CONSULTING REPORTS

"Operational Risk Analysis: California Water Utilities," Calif. Water Association, 1993.

"Cost of Capital Methodologies for Independent Telephone Systems", Ontario Telephone Service Commission, March 1989.

"The Effect of CWIP on Cost of Capital and Revenue Requirements", Georgia Power Company, 1985.

"Costing Methodology and the Effect of Alternate Depreciation and Costing Methods on Revenue Requirements and Utility Finances", Gaz Metropolitan Inc., 1985.

"Simulated Capital Structure of CN-CP Telecommunications: A Critique", CRTC, 1977.

APPENDIX A RESUME OF DR. ROGER A MORIN

"Telecommunications Cost Inquiry: Critique", CRTC, 1977.

"Social Rate of Discount in the Public Sector", CRTC Policy Statement, 1974.

"Technical Problems in Capital Projects Analysis", CRTC Policy Statement, 1974.

RESEARCH GRANTS

"Econometric Planning Model of the Cablevision Industry", International Institute of Quantitative Economics, CRTC.

"Application of the Averch-Johnson Model to Telecommunications Utilities", Canadian Radio-Television Commission. (CRTC)

"Economics of the Fiber Optics Industry", Quebec Dept. of Communications.

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UNIVERSITY SERVICE

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APPENDIX A
RESUME OF DR. ROGER A MORIN

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APPENDIX B

CAPM, EMPIRICAL CAPM

The Capital Asset Pricing Model (CAPM) is a fundamental paradigm of finance. Simply put, the fundamental idea underlying the CAPM is that risk-averse investors demand higher returns for assuming additional risk, and higher-risk securities are priced to yield higher expected returns than lower-risk securities. The CAPM quantifies the additional return, or risk premium, required for bearing incremental risk. It provides a formal risk-return relationship anchored on the basic idea that only market risk matters, as measured by beta. According to the CAPM, securities are priced such that their:

$$\text{EXPECTED RETURN} = \text{RISK-FREE RATE} + \text{RISK PREMIUM}$$

Denoting the risk-free rate by R_F and the return on the market as a whole by R_M , the CAPM is:

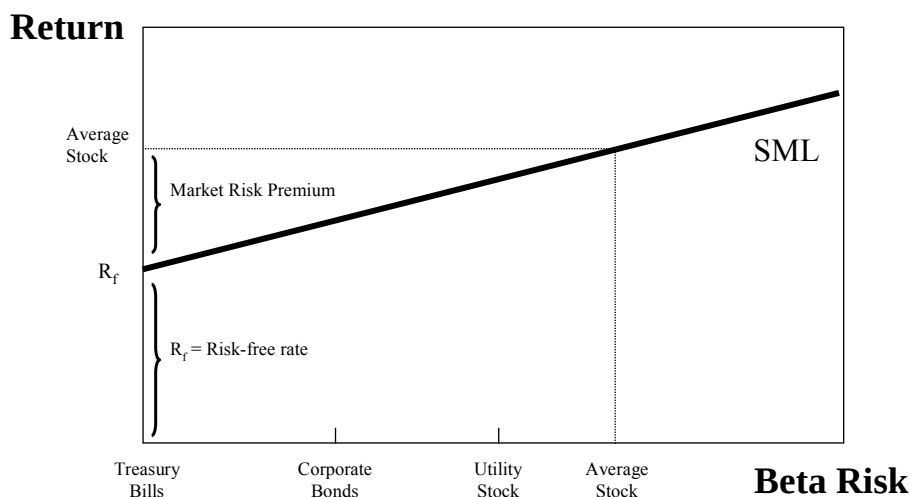
$$K = R_F + \beta(R_M - R_F) \quad (1)$$

Equation 1 is the CAPM expression which asserts that an investor expects to earn a return, K , that could be gained on a risk-free investment, R_F , plus a risk premium for assuming risk, proportional to the security's market risk, also known as beta, β , and the market risk premium, $(R_M - R_F)$, where R_M is the market return. The market risk premium $(R_M - R_F)$ can be abbreviated MRP so that the CAPM becomes:

$$K = R_F + \beta \times \text{MRP} \quad (2)$$

The CAPM risk-return relationship is depicted in the figure below and is typically labeled as the Security Market Line (SML) by the investment community.

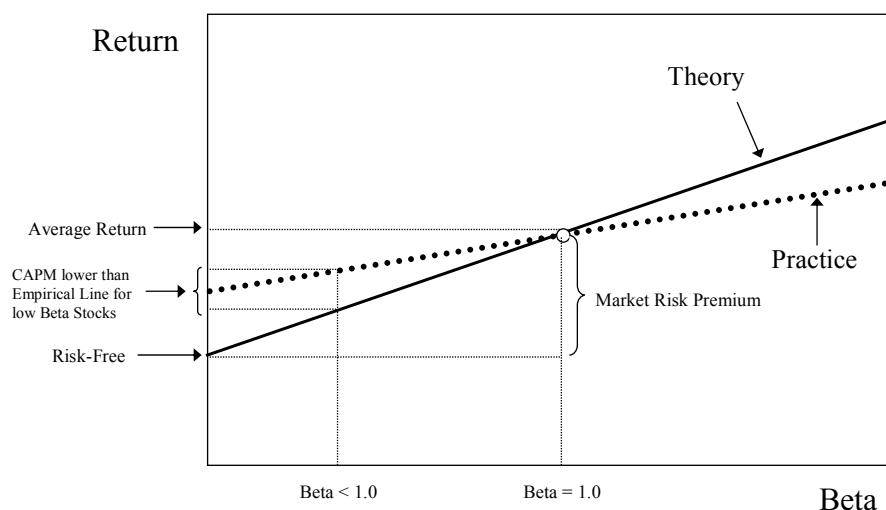
CAPM and Risk - Return in Capital Markets



A myriad empirical tests of the CAPM have shown that the risk-return tradeoff is not as steeply sloped as that predicted by the CAPM, however. That is, low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted. In other words, the CAPM tends to overstate the actual sensitivity of the cost of capital to beta: low-beta stocks tend to have higher returns and high-beta stocks tend to have lower risk returns than predicted by the CAPM. The difference between the CAPM and the type of relationship observed in the empirical studies is depicted in the figure below. This is one of the most widely known empirical findings of the finance literature. This extensive literature is summarized in Chapter 13 of Dr. Morin's book [Regulatory Finance, Public Utilities Report Inc., Arlington, VA, 1994].

Risk vs Return

Theory vs. Practice



A number of refinements and expanded versions of the original CAPM theory have been proposed to explain the empirical findings. These revised CAPMs typically produce a risk-return relationship that is flatter than the standard CAPM prediction. The following equation makes use of these empirical findings by flattening the slope of the risk-return relationship and increasing the intercept:

$$K = R_F + \alpha + \beta (MRP - \alpha) \quad (3)$$

where α is the "alpha" of the risk-return line, a constant determined empirically, and the other symbols are defined as before. Alternatively, Equation 3 can be written as follows:

$$K = R_F + a MRP + (1-a) \beta MRP \quad (4)$$

where a is a fraction to be determined empirically. Comparing Equations 3 and 4, it is easy to see that alpha equals 'a' times MRP, that is, $\alpha = a \times MRP$

Theoretical Underpinnings

The obvious question becomes what would produce a risk return relationship which is flatter than the CAPM prediction, or in other words, how do you explain the presence of “alpha” in the above equation. The exclusion of variables aside from beta would produce this result. Three such variables are noteworthy: dividend yield, skewness, and hedging potential.

The dividend yield effects stem from the differential taxation on corporate dividends and capital gains. The standard CAPM does not consider the regularity of dividends received by investors. Utilities generally maintain high dividend payout ratios relative to the market, and by ignoring dividend yield, the CAPM provides biased cost of capital estimates. To the extent that dividend income is taxed at a higher rate than capital gains, investors will require higher pre-tax returns in order to equalize the after-tax returns provided by high-yielding stocks (e.g. utility stocks) with those of low-yielding stocks. In other words, high-yielding stocks must offer investors higher pre-tax returns. Even if dividends and capital gains are undifferentiated for tax purposes, there is still a tax bias in favor of earnings retention (lower dividend payout), as capital gains taxes are paid only when gains are realized.

Empirical studies by Litzenberger and Ramaswamy (1979), Litzenberger et al. (1980) and Rosenberg and Marathe (1975) find that security returns are positively related to dividend yield as well as to beta. These results are consistent with after-tax extensions of the CAPM developed by Breenan (1973) and Litzenberger and Ramaswamy (1979) and suggest that the relationship between return, beta, and dividend yield should be estimated and employed to calculate the cost of equity capital.

As far as skewness is concerned, investors are more concerned with losing money than with total variability of return. If risk is defined as the probability of loss, it appears more logical to measure risk as the probability of achieving a return which is below the expected return. The traditional CAPM provides downward-biased estimates of cost of capital to the extent that these skewness effects are significant. As shown by Kraus and Litzenberger (1976), expected return depends on both on a stock's systematic risk (beta) and the systematic skewness. Empirical studies by Kraus and Litzenberger (1976),

Friend, Westerfield, and Granito (1978), and Morin (1981) found that, in addition to beta, skewness of returns has a significant negative relationship with security returns. This result is consistent with the skewness version of the CAPM developed by Rubinstein (1973) and Kraus and Litzenberger (1976).

This is particularly relevant for public utilities whose future profitability is constrained by the regulatory process on the upside and relatively unconstrained on the downside in the face of socio-political realities of public utility regulation. The process of regulation, by restricting the upward potential for returns and responding sluggishly on the downward side, may impart some asymmetry to the distribution of returns, and is more likely to result in utilities earning less, rather than more, than their cost of capital. The traditional CAPM provides downward-biased estimates of cost of capital to the extent that these skewness effects are significant.

As far as hedging potential is concerned, investors are exposed to another kind of risk, namely, the risk of unfavorable shifts in the investment opportunity set. Merton (1973) shows that investors will hold portfolios consisting of three funds: the risk-free asset, the market portfolio, and a portfolio whose returns are perfectly negatively correlated with the riskless asset so as to hedge against unforeseen changes in the future risk-free rate. The higher the degree of protection offered by an asset against unforeseen changes in interest rates, the lower the required return, and conversely. Merton argues that low beta assets, like utility stocks, offer little protection against changes in interest rates, and require higher returns than suggested by the standard CAPM.

Another explanation for the CAPM's inability to fully explain the process determining security returns involves the use of an inadequate or incomplete market index. Empirical studies to validate the CAPM invariably rely on some stock market index as a proxy for the true market portfolio. The exclusion of several asset categories from the definition of market index mis-specifies the CAPM and biases the results found using only stock market data. Kolbe and Read (1983) illustrate the biases in beta estimates which result from applying the CAPM to public utilities. Unfortunately, no comprehensive and easily accessible data exist for several classes of assets, such as mortgages and business investments, so that the exact relation between return and stock betas predicted by the CAPM does not exist. This suggests that the empirical relationship

between returns and stock betas is best estimated empirically (ECAPM) rather than by relying on theoretical and elegant CAPM models expanded to include missing assets effects. In any event, stock betas may be highly correlated with the true beta measured with the true market index.

Yet another explanation for the CAPM's inability to fully explain the observed risk-return tradeoff involves the possibility of constraints on investor borrowing that run counter to the assumptions of the CAPM. In response to this inadequacy, several versions of the CAPM have been developed by researchers. One of these versions is the so-called zero-beta, or two-factor, CAPM which provides for a risk-free return in a market where borrowing and lending rates are divergent. If borrowing rates and lending rates differ, or there is no risk-free borrowing or lending, or there is risk-free lending but no risk-free borrowing, then the CAPM has the following form:

$$K = R_Z + \beta(R_m - R_F)$$

The model, christened the zero-beta model, is analogous to the standard CAPM, but with the return on a minimum risk portfolio which is unrelated to market returns, R_Z , replacing the risk-free rate, R_F . The model has been empirically tested by Black, Jensen, and Scholes (1972), who found a flatter than predicted CAPM, consistent with the model and other researchers' findings.

The zero-beta CAPM cannot be literally employed in cost of capital projections, since the zero-beta portfolio is a statistical construct difficult to replicate.

Empirical Evidence

A summary of the empirical evidence on the magnitude of alpha is provided in the table below.

Empirical Evidence on the Alpha Factor		
Author	Range of alpha	Period relied upon
Fischer (1993)	-3.6% to 3.6%	1931-1991
Fischer, Jensen and Scholes (1972)	-9.61% to 12.24%	1931-1965
Fama and McBeth (1972)	4.08% to 9.36%	1935-1968
Fama and French (1992)	10.08% to 13.56%	1941-1990
Litzenberger and Ramaswamy (1979)	5.32% to 8.17%	
Litzenberger, Ramaswamy and Sosin (1980)	1.63% to 5.04%	1926-1978
Pettengill, Sundaram and Mathur (1995)	4.6%	
Morin (1994)	2.0%	1926-1984
Harris, Marston, Mishra, and O'Brien	2.0%	1983-1998

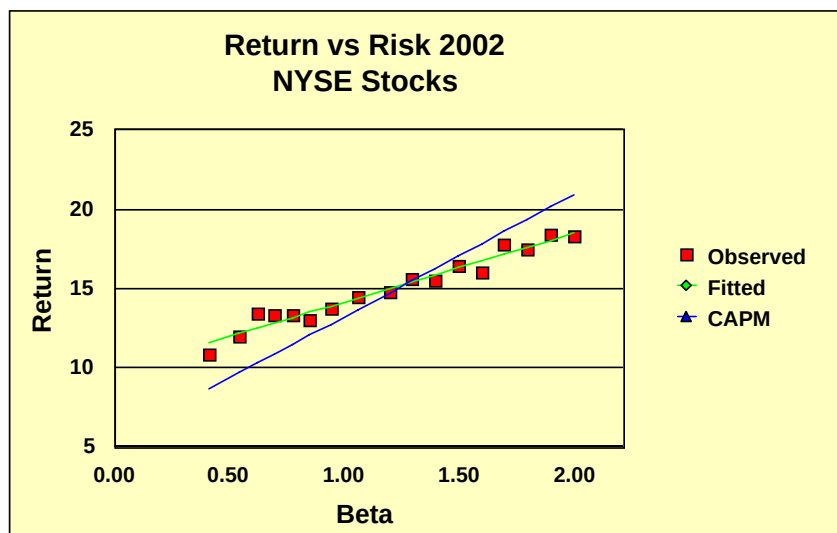
Given the observed magnitude of alpha, the empirical evidence indicates that the risk-return relationship is flatter than that predicted by the CAPM. Typical of the empirical evidence is the findings cited in Morin (1994) over the period 1926-1984 indicating that the observed expected return on a security is related to its risk by the following equation:

$$K = .0829 + .0520 \beta$$

Given that the risk-free rate over the estimation period was approximately 6%, this relationship implies that the intercept of the risk-return relationship is higher than the 6% risk-free rate, contrary to the CAPM's prediction. Given that the average return on an average risk stock exceeded the risk-free rate by about 8.0% in that period, that is, the market risk premium ($R_M - R_F$) = 8%, the intercept of the observed relationship between return and beta exceeds the risk-free rate by about 2%, suggesting an alpha factor of 2%.

Most of the empirical studies cited in the above table utilize raw betas rather than Value Line adjusted betas because the latter were not available over most of the time periods covered in these studies. A study of the relationship between return and adjusted beta is reported on Table 6-7 in Ibbotson Associates Valuation Yearbook 2001. If we exclude the portfolio of very small cap stocks from the relationship due to significant size effects, the relationship between the arithmetic mean return and beta for the remaining portfolios is flatter than predicted and the intercept slightly higher than predicted by the CAPM, as shown on the graph below. It is noteworthy that the Ibbotson study relies on adjusted betas as stated on page 95 of the aforementioned study.

CAPM vs ECAPM

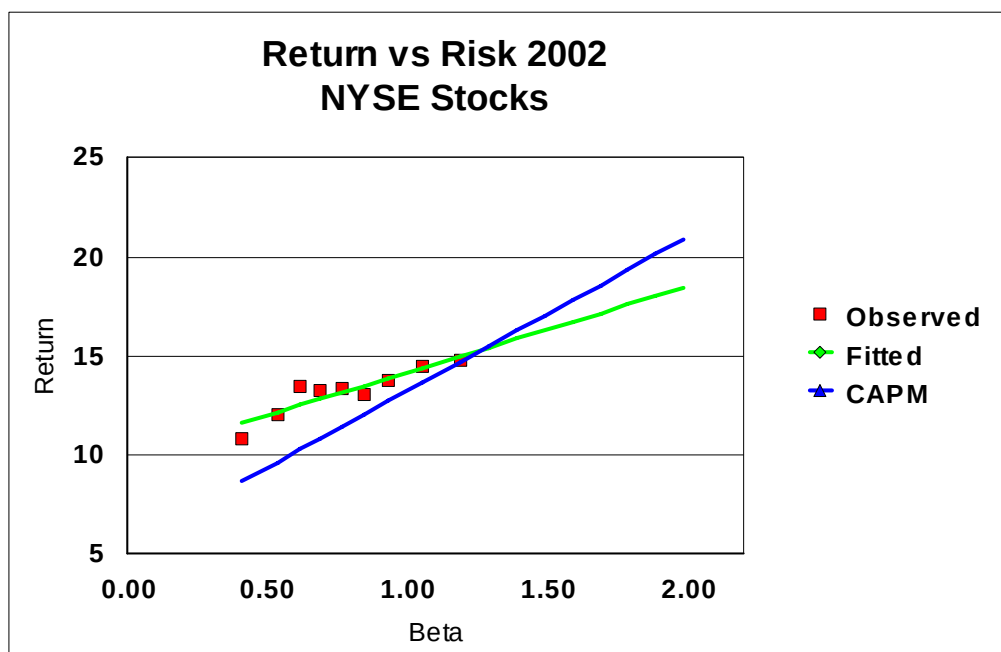


Another study by Morin in May 2002 provides empirical support for the ECAPM. All the stocks covered in the Value Line Investment Survey for Windows for which betas and returns data were available were retained for analysis. There were nearly 2000 such stocks. The expected return was measured as the total shareholder return ("TSR") reported by Value Line over the past ten years. The Value Line adjusted beta was also retrieved from the same data base. The nearly 2000 companies for which all data were available were ranked in ascending order of beta, from lowest to highest. In order to palliate measurement error, the nearly 2000 securities were grouped into ten portfolios of

approximately 180 securities for each portfolio. The average returns and betas for each portfolio were as follows:

Portfolio #	Beta	Return
portfolio 1	0.41	10.87
portfolio 2	0.54	12.02
portfolio 3	0.62	13.50
portfolio 4	0.69	13.30
portfolio 5	0.77	13.39
portfolio 6	0.85	13.07
portfolio 7	0.94	13.75
portfolio 8	1.06	14.53
portfolio 9	1.19	14.78
portfolio 10	1.48	20.78

It is clear from the graph below that the observed relationship between DCF returns and Value Line adjusted betas is flatter than that predicted by the plain vanilla CAPM. The observed intercept is higher than the prevailing risk-free rate of 5.7% while the slope is less than equal to the market risk premium of 7.7% predicted by the plain vanilla CAPM for that period.



In an article published in Financial Management, Harris, Marston, Mishra, and O'Brien ("HMMO") estimate ex ante expected returns for S&P 500 companies over the period 1983-1998¹. HMMO measure the expected rate of return (cost of equity) of each dividend-paying stock in the S&P 500 for each month from January 1983 to August 1998 by using the constant growth DCF model. They then investigate the relation between the risk premium (expected return over the 20-year Treasury bond yield) estimates for each month to equity betas as of that same month (5-year raw betas).

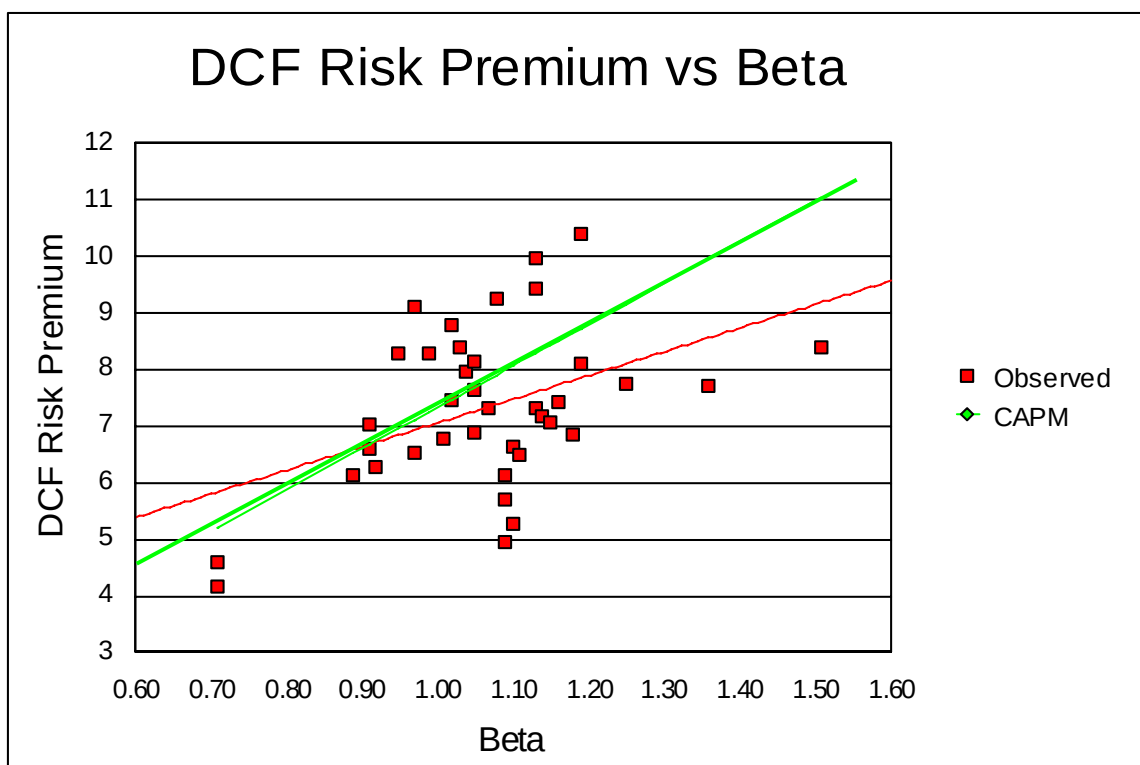
The table below, drawn from HMMO Table 4, displays the average estimate prospective risk premium (Column 2) by industry and the corresponding beta estimate for that industry, both in raw form (Column 3) and adjusted form (Column 4). The latter were calculated with the traditional Value Line – Merrill Lynch – Bloomberg adjustment methodology by giving 1/3 weight of to a beta estimate of 1.00 and 2/3 weight to the raw beta estimate.

¹ Harris, R. S., Marston, F. C., Mishra, D. R., and O'Brien, T. J., "Ex Ante Cost of Equity Estimates of S&P 500 Firms: The Choice Between Global and Domestic CAPM," Financial

Table A-1 Risk Premium and Beta Estimates by Industry

	Industry	DCF Risk Premium	Raw Industry Beta	Adjusted Industry Beta
	(1)	(2)	(3)	(4)
1	Aero	6.63	1.15	1.10
2	Autos	5.29	1.15	1.10
3	Banks	7.16	1.21	1.14
4	Beer	6.60	0.87	0.91
5	BldMat	6.84	1.27	1.18
6	Books	7.64	1.07	1.05
7	Boxes	8.39	1.04	1.03
8	BusSv	8.15	1.07	1.05
9	Chems	6.49	1.16	1.11
10	Chips	8.11	1.28	1.19
11	Clths	7.74	1.37	1.25
12	Cnstr	7.70	1.54	1.36
13	Comps	9.42	1.19	1.13
14	Drugs	8.29	0.99	0.99
15	ElcEq	6.89	1.08	1.05
16	Energy	6.29	0.88	0.92
17	Fin	8.38	1.76	1.51
18	Food	7.02	0.86	0.91
19	Fun	9.98	1.19	1.13
20	Gold	4.59	0.57	0.71
21	Hlth	10.40	1.29	1.19
22	Hsld	6.77	1.02	1.01
23	Insur	7.46	1.03	1.02
24	LabEq	7.31	1.10	1.07
25	Mach	7.32	1.20	1.13
26	Meals	7.98	1.06	1.04
27	MedEq	8.80	1.03	1.02
28	Pap	6.14	1.13	1.09
29	PerSv	9.12	0.95	0.97
30	Retail	9.27	1.12	1.08
31	Rubber	7.06	1.22	1.15
32	Ships	1.95	0.95	0.97
33	Stee	4.96	1.13	1.09
34	Telc	6.12	0.83	0.89
35	Toys	7.42	1.24	1.16
36	Trans	5.70	1.14	1.09
37	Txtls	6.52	0.95	0.97
38	Util	4.15	0.57	0.71
39	Whlsl	8.29	0.92	0.95
	MEAN	7.19		

The observed statistical relationship between expected return and **adjusted beta** is shown in the graph below along with the CAPM prediction:



If the plain vanilla version of the CAPM is correct, then the intercept of the graph should be zero, recalling that the vertical axis represents returns in excess of the risk-free rate. Instead, the observed intercept is approximately 2%, that is approximately equal to 25% of the expected market risk premium of 7.2% shown at the bottom of Column 2 over the 1983-1998 period, as predicted by the ECAPM. The same is true for the slope of the graph. If the plain vanilla version of the CAPM is correct, then the slope of the relationship should equal the market risk premium of 7.2%. Instead, the observed slope of close to 5% is approximately equal to 75% of the expected market risk premium of 7.2%, as predicted by the ECAPM.

In short, the HMMO empirical findings are quite consistent with the predictions of the ECAPM.

Practical Implementation of the ECAPM

The empirical evidence reviewed above suggests that the expected return on a security is related to its risk by the following relationship:

$$K = R_F + \alpha + \beta (MRP - \alpha) \quad (5)$$

or, alternatively by the following equivalent relationship:

$$K = R_F + a MRP + (1-a) \beta MRP \quad (6)$$

The empirical findings support values of α from approximately 2% to 7%. If one is using the short-term U.S. Treasury Bills yield as a proxy for the risk-free rate, and given that utility stocks have lower than average betas, an alpha in the lower range of the empirical findings, 2% - 3% is reasonable, albeit conservative.

Using the long-term U.S. Treasury yield as a proxy for the risk-free rate, a lower alpha adjustment is indicated. This is because the use of the long-term U.S. Treasury yield as a proxy for the risk-free rate partially incorporates the desired effect of using the ECAPM². An alpha in the range of 1% - 2% is therefore reasonable.

To illustrate, consider a utility with a beta of 0.80. The risk-free rate is 5%, the MRP is 7%, and the alpha factor is 2%. The cost of capital is determined as follows:

$$\begin{aligned} K &= R_F + \alpha + \beta (MRP - \alpha) \\ K &= 5\% + 2\% + 0.80(7\% - 2\%) \\ &= 11\% \end{aligned}$$

A practical alternative is to rely on the second variation of the ECAPM:

$$K = R_F + a MRP + (1-a) \beta MRP$$

² The Security Market Line (SML) using the long-term risk-free rate has a higher intercept and a flatter slope than the SML using the short-term risk-free rate

With an alpha of 2%, a MRP in the 6% - 8% range, the 'a' coefficient is 0.25, and the ECAPM becomes³:

$$K = R_F + 0.25 \text{ MRP} + 0.75 \beta \text{ MRP}$$

Returning to the numerical example, the utility's cost of capital is:

$$\begin{aligned} K &= 5\% + 0.25 \times 7\% + 0.75 \times 0.80 \times 7\% \\ &= 11\% \end{aligned}$$

For reasonable values of beta and the MRP, both renditions of the ECAPM produce results that are virtually identical⁴.

³ Recall that alpha equals 'a' times MRP, that is, $\alpha = a \text{ MRP}$, and therefore $a = \alpha/\text{MRP}$. If alpha is 2%, then $a = 0.25$

⁴ In the Morin (1994) study, the value of "a" was actually derived by systematically varying the constant "a" in equation 6 from 0 to 1 in steps of 0.05 and choosing that value of 'a' that minimized the mean square error between the observed relationship between return and beta:

$$K = 0.0829 + .0520 \beta$$

The value of a that best explained the observed relationship was 0.25.

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APPENDIX C

FLOTATION COST ALLOWANCE

To obtain the final cost of equity financing from the investors' expected rate of return, it is necessary to make allowance for underpricing, which is the sum of market pressure, costs of flotation, and underwriting fees associated with new issues. Allowance for market pressure should be made because large blocks of new stock may cause significant pressure on market prices even in stable markets. Allowance must also be made for company costs of flotation (including such items as printing, legal and accounting expenses) and for underwriting fees.

1. MAGNITUDE OF FLOTATION COSTS

According to empirical studies, underwriting costs and expenses average at least 4% of gross proceeds for utility stock offerings in the U.S. (See Logue & Jarrow: "Negotiations vs. Competitive Bidding in the Sale of Securities by Public Utilities", Financial Management, Fall 1978.) A study of 641 common stock issues by 95 electric utilities identified a flotation cost allowance of 5.0%. (See Borum & Malley: "Total Flotation Cost for Electric Company Equity Issues", Public Utilities Fortnightly, Feb. 20, 1986.)

Empirical studies suggest an allowance of 1% for market pressure in U.S. studies. Logue and Jarrow found that the absolute magnitude of the relative price decline due to market pressure was less than 1.5%. Bowyer and Yawitz examined 278 public utility stock issues and found an average market pressure of 0.72%. (See Bowyer & Yawitz, "The Effect of New Equity Issues on Utility Stock Prices", Public Utilities Fortnightly, May 22, 1980.)

Eckbo & Masulis ("Rights vs. Underwritten Stock Offerings: An Empirical Analysis", University of British Columbia, Working Paper No. 1208, Sept., 1987) found an average flotation cost of 4.175% for utility common stock offerings. Moreover, flotation costs increased progressively for smaller size issues. They also found that the relative price decline due to market pressure in the days

surrounding the announcement amounted to slightly more than 1.5%. In a classic and monumental study published in the prestigious Journal of Financial Economics by a prominent scholar, a market pressure effect of 3.14% for industrial stock issues and 0.75% for utility common stock issues was found (see Smith, C.W., "Investment Banking and the Capital Acquisition Process," Journal of Financial Economics 15, 1986). Other studies of market pressure are reported in Logue ("On the Pricing of Unseasoned Equity Offerings, Journal of Financial and Quantitative Analysis, Jan. 1973), Pettway ("The Effects of New Equity Sales Upon Utility Share Prices," Public Utilities Fortnightly, May 10 1984), and Reilly and Hatfield ("Investor Experience with New Stock Issues," Financial Analysts' Journal, Sept.- Oct. 1969). In the Pettway study, the market pressure effect for a sample of 368 public utility equity sales was in the range of 2% to 3%. Adding the direct and indirect effects of utility common stock issues, the indicated total flotation cost allowance is above 5.0%, corroborating the results of earlier studies.

As shown in the table below, a comprehensive empirical study by Lee, Lochhead, Ritter, and Zhao, "The Costs of Raising Capital," Journal of Financial Research, Vol. XIX, NO. 1, Spring 1996, shows average direct flotation costs for equity offerings of 3.5% - 5% for stock issues between \$60 and \$500 million. Allowing for market pressure costs raises the flotation cost allowance to well above 5%.

FLOTATION COSTS: RAISING EXTERNAL CAPITAL

(Percent of Total Capital Raised)

Amount Raised in \$ Millions	Average Flotation Cost: Common Stock	Average Flotation Cost: New Debt
\$ 2 - 9.99	13.28%	4.39%
10 - 19.99	8.72	2.76
20 - 39.99	6.93	2.42
40 - 59.99	5.87	1.32
60 - 79.99	5.18	2.34
80 - 99.99	4.73	2.16
100 - 199.99	4.22	2.31
200 - 499.99	3.47	2.19
500 and Up	3.15	1.64

Note: Flotation costs for IPOs are about 17 percent of the value of common stock issued if the amount raised is less than \$10 million and about 6 percent if more than \$500 million is raised. Flotation costs are somewhat lower for utilities than others.

Source: Lee, Inmoo, Scott Lochhead, Jay Ritter, and Quanshui Zhao, "The Costs of Raising Capital," *The Journal of Financial Research*, Spring 1996.

Therefore, based on empirical studies, total flotation costs including market pressure amount to approximately 5% of gross proceeds. I have therefore assumed a 5% gross total flotation cost allowance in my cost of capital analyses.

2. APPLICATION OF THE FLOTATION COST ADJUSTMENT

The section below shows: 1) why it is necessary to apply an allowance of 5% to the dividend yield component of equity cost by dividing that yield by 0.95 (100% - 5%) to obtain the fair return on equity capital, and 2) why the flotation adjustment is permanently required to avoid confiscation even if

no further stock issues are contemplated. Flotation costs are only recovered if the rate of return is applied to total equity, including retained earnings, in all future years.

Flotation costs are just as real as costs incurred to build utility plant. Fair regulatory treatment absolutely must permit the recovery of these costs. An analogy with bond issues is useful to understand the treatment of flotation costs in the case of common stocks.

In the case of a bond issue, flotation costs are not expensed but are rather amortized over the life of the bond, and the annual amortization charge is embedded in the cost of service. This is analogous to the process of depreciation, which allows the recovery of funds invested in utility plant. The recovery of bond flotation expense continues year after year, irrespective of whether the company issues new debt capital in the future, until recovery is complete. In the case of common stock that has no finite life, flotation costs are not amortized. Therefore, the recovery of flotation cost requires an upward adjustment to the allowed return on equity. Roger A. Morin, Regulatory Finance, Public Utilities Reports Inc., Arlington, Va., 1994, provides numerical illustrations that show that even if a utility does not contemplate any additional common stock issues, a flotation cost adjustment is still permanently required. Examples there also demonstrate that the allowance applies to retained earnings as well as to the original capital.

From the standard DCF model, the investor's required return on equity capital is expressed as:

$$K = D_1/P_o + g$$

If P_o is regarded as the proceeds per share actually received by the company from which dividends and earnings will be generated, that is, P_o equals B_o , the book value per share, then the company's required return is:

$$r = D_1/B_o + g$$

Denoting the percentage flotation costs 'f', proceeds per share B_o are related to market price P_o as follows:

$$P - fP = B_o$$

$$P(1 - f) = B_o$$

Substituting the latter equation into the above expression for return on equity, we obtain:

$$r = D_1/P(1-f) + g$$

that is, the utility's required return adjusted for underpricing. For flotation costs of 5%, dividing the expected dividend yield by 0.95 will produce the adjusted cost of equity capital. For a dividend yield of 6% for example, the magnitude of the adjustment is 32 basis points: $.06/.95 = .0632$.

In deriving DCF estimates of fair return on equity, it is therefore necessary to apply a conservative after-tax allowance of 5% to the dividend yield component of equity cost.

Even if no further stock issues are contemplated, the flotation adjustment is still permanently required to keep shareholders whole. Flotation costs are only recovered if the rate of return is applied to total equity, including retained earnings, in all future years, even if no future financing is contemplated. This is demonstrated by the numerical example contained in pages 7-9 of this Appendix. Moreover, even if the stock price, hence the DCF estimate of equity return, fully reflected the lack of permanent allowance, the company always nets less than the market price. Only the net proceeds from an equity issue are used to add to the rate base on which the investor earns. A permanent allowance for flotation costs must be authorized in order to insure that in each year the investor earns the required return on the total amount of capital actually supplied.

The example shown on pages 7-9 shows the flotation cost adjustment process using illustrative, yet realistic, market data. The assumptions used in the computation are shown on page 7. The stock is selling in the market for \$25, investors expect the firm to pay a dividend of \$2.25 that will grow at a rate of 5% thereafter. The traditional DCF cost of equity is thus $k = D/P + g = 2.25/25 + .05 = 14\%$. The firm sells one share stock, incurring a flotation cost of 5%. The traditional DCF cost of equity adjusted for flotation cost is thus $ROE = D/P(1-f) + g = .09/.95 + .05 = 14.47\%$.

The initial book value (rate base) is the net proceeds from the stock issue, which are \$23.75, that is, the market price less the 5% flotation costs. The example demonstrates that only if the company is allowed to earn 14.47% on rate base will investors earn their cost of equity of 14%. On page 8, Column 1 shows the initial common stock account, Column 2 the cumulative retained earnings balance, starting at zero, and steadily increasing from the retention of earnings. Total equity in Column 3 is the sum of common stock capital and retained earnings. The stock price in Column 4 is obtained from the seminal

DCF formula: $D_1/(k - g)$. Earnings per share in Column 6 are simply the allowed return of 14.47% times the total common equity base. Dividends start at \$2.25 and grow at 5% thereafter, which they must do if investors are to earn a 14% return. The dividend payout ratio remains constant, as per the assumption of the DCF model. All quantities, stock price, book value, earnings, and dividends grow at a 5% rate, as shown at the bottom of the relevant columns. Only if the company is allowed to earn 14.47% on equity do investors earn 14%. For example, if the company is allowed only 14%, the stock price drops from \$26.25 to \$26.13 in the second year, inflicting a loss on shareholders. This is shown on page 9. The growth rate drops from 5% to 4.53%. Thus, investors only earn $9\% + 4.53\% = 13.53\%$ on their investment. It is noteworthy that the adjustment is always required each and every year, whether or not new stock issues are sold in the future, and that the allowed return on equity must be earned on total equity, including retained earnings, for investors to earn the cost of equity.

ASSUMPTIONS:

ISSUE PRICE = \$25.00
FLOTATION COST = 5.00%
DIVIDEND YIELD = 9.00%
GROWTH = 5.00%

EQUITY RETURN = **14.00%**
(D/P + g)
ALLOWED RETURN ON EQUITY = **14.47%**
(D/P(1-f) + g)

Yr	COMMON STOCK (1)	RETAINED EARNINGS (2)	TOTAL EQUITY (3)	STOCK PRICE (4)	MARKET / BOOK RATIO (5)	EPS (6)	DPS (7)	PAYOUT (8)
1	\$23.75	\$0.000	\$23.750	\$25.000	1.0526	\$3.438	\$2.250	65.45%
2	\$23.75	\$1.188	\$24.938	\$26.250	1.0526	\$3.609	\$2.363	65.45%
3	\$23.75	\$2.434	\$26.184	\$27.563	1.0526	\$3.790	\$2.481	65.45%
4	\$23.75	\$3.744	\$27.494	\$28.941	1.0526	\$3.979	\$2.605	65.45%
5	\$23.75	\$5.118	\$28.868	\$30.388	1.0526	\$4.178	\$2.735	65.45%
6	\$23.75	\$6.562	\$30.312	\$31.907	1.0526	\$4.387	\$2.872	65.45%
7	\$23.75	\$8.077	\$31.827	\$33.502	1.0526	\$4.607	\$3.015	65.45%
8	\$23.75	\$9.669	\$33.419	\$35.178	1.0526	\$4.837	\$3.166	65.45%
9	\$23.75	\$11.340	\$35.090	\$36.936	1.0526	\$5.079	\$3.324	65.45%
10	\$23.75	\$13.094	\$36.844	\$38.783	1.0526	\$5.333	\$3.490	65.45%
			5.00%	5.00%				
					5.00%	5.00%		

	COMMON STOCK	RETAINED EARNINGS	TOTAL EQUITY	STOCK PRICE	MARKET/ BOOK RATIO	EPS	DPS	PAYOUT
Yr	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	\$23.75	\$0.000	\$23.750	\$25.000	1.0526	\$3.325	\$2.250	67.67%
2	\$23.75	\$1.075	\$24.825	\$26.132	1.0526	\$3.476	\$2.352	67.67%
3	\$23.75	\$2.199	\$25.949	\$27.314	1.0526	\$3.633	\$2.458	67.67%
4	\$23.75	\$3.373	\$27.123	\$28.551	1.0526	\$3.797	\$2.570	67.67%
5	\$23.75	\$4.601	\$28.351	\$29.843	1.0526	\$3.969	\$2.686	67.67%
6	\$23.75	\$5.884	\$29.634	\$31.194	1.0526	\$4.149	\$2.807	67.67%
7	\$23.75	\$7.225	\$30.975	\$32.606	1.0526	\$4.337	\$2.935	67.67%
8	\$23.75	\$8.627	\$32.377	\$34.082	1.0526	\$4.533	\$3.067	67.67%
9	\$23.75	\$10.093	\$33.843	\$35.624	1.0526	\$4.738	\$3.206	67.67%
10	\$23.75	\$11.625	\$35.375	\$37.237	1.0526	\$4.952	\$3.351	67.67%
			4.53%	4.53%		4.53%	4.53%	