TESTIMONY

OF

ROGER A. MORIN

FAIR RETURN ON COMMON EQUITY

FOR

TransEnergie

UTILITY RESEARCH INTERNATIONAL

ROGER A. MORIN, PhD

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Direct Testimony of Roger A. Morin
On behalf of TransEnergie
Before the Régie de l'Energie du Québec

Table of Contents page

PERSONAL INTRODUCTION 1
BACKGROUND 3
PURPOSE OF TESTIMONY 5
SUMMARY OF TESTIMONY 5
TESTIMONY ORGANIZATION 6
I. CONCEPTUAL BACKGROUND 6
I. 1 Risk and Return 6
I. 2 ROE in Practice 9
I. 3 Divisional Cost of Capital 10
II. RISK ENVIRONMENT 12
II.1 Business Risk 12
II.2 Regulatory Risk 14
II.3 Financial Risk 15
III. RATE OF RETURN ESTIMATES 16
III.1 Risk Premium: CAPM Estimate 16
III. 2 Risk Premium: U.S. Electric Utilities 29
III. 3 Risk Premium: U.S. Natural Gas Utilities 29
III. 4 Risk Premium Estimates: Summary 30
III. 5 Risk Premium: Additional Checks 30
III. 6 Risk-Free Rate 37
III. 7 DCF Checks 38
IV. CAPITAL STRUCTURE 39
V. SUMMARY 43
APPENDIX A A REVIEW OF ROE METHODOLOGIES
APPENDIX A TECHNICAL SUPPLEMENT: RESERVATIONS ON THE DCF MODEL

Direct Testimony of Roger A. Morin
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EXHIBITS

Exhibit RAM-1	Roger A. Morin - Resume
Exhibit RAM-2	Moody's Electric Utilities Risk Premium Analysis 1985-1999
Exhibit RAM-3	Moody's Electric Utility Common Stock Long-Term Risk Premium Analysis
Exhibit RAM-4	Moody's Natural Gas Utilities Risk Premium Analysis
Exhibit RAM-5	Moody's Natural Gas Utility Common Stock Long-Term Risk Premium Analysis
Exhibit RAM-6	Generation Divested Electric Utilities DCF Analysis
Exhibit RAM-7	Capital Structures Adopted by Regulatory Boards: Canadian Energy Utilities
Exhibit RAM-8	Actual Common Equity Ratios Canadian Energy Utilities
Exhibit RAM-9	Canadian Electric Utilities % Equity in the Capital Structure Utilities
Exhibit RAM-10	Actual Capital Structures: U.S. Energy Utilities
Exhibit RAM-11	Business Risk Betas: Canadian Energy Utilities

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PERSONAL INTRODUCTION

My name is Dr. Roger A. Morin. My permanent residence is in Atlanta, Georgia. I am Professor of Finance at the Robinson College of Business, Georgia State University and Professor of Finance for Regulated Industry at the Center for the Study of Regulated Industry at Georgia State University.

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

I have taught at University of Montreal's Hautes Etudes Commerciales, McGill University, the Wharton School of Finance at the University of Pennsylvania, Amos Tuck School of Business at Dartmouth College, Drexel University, and Georgia State University. In addition, I have developed and conducted numerous executive development programs for the University of Montreal, Hydro-Québec, Canadian Institute of Marketing, Investment Dealers Association of Canada, Financial Research Foundation of Canada, and Georgia State University. I was a faculty member of Advanced Management Research International, and I am currently a faculty member of The Management Exchange Inc., now known as Exnet, where I conduct frequent national executive-level education seminars throughout the United States and Canada. In the last twenty years, and throughout 2000, I am conducting regular national seminars on "Utility Cost of Capital", "Utility Capital Allocation", and «Alternative Regulatory Frameworks», which I have developed on behalf of The Management Exchange Inc. in conjunction with Public Utilities Reports Inc.

I have authored several books, monographs, and articles in academic scientific journals on the subject of finance. They have appeared in a variety of journals,

including The Journal of Finance, The Journal of Business Administration, International Management Review, and Public Utility Fortnightly. I published a widely-used treatise on regulatory finance, Utilities' Cost of Capital, Public Utilities Reports Inc., Arlington, Va. 1984. My more recent book, Regulatory Finance, a voluminous treatise on the application of finance to regulated utilities, was published in late 1994 by Public Utilities Reports Inc., Arlington, Va..

I served for three years as a consultant in computer applications in finance and investments for the Financial Research Institute of Canada. I was co-founder and director of the Canadian Finance Research Foundation. I have engaged in extensive consulting activities on behalf of numerous corporations and legal firms in matters of financial management and corporate litigation. Exhibit RAM-1 describes my professional credentials in more detail.

I have been a cost of capital witness before numerous federal and provincial/state regulatory boards in both Canada and the U.S., including the Régie de l'Energie du Québec («Régie»). In Canada at the federal level, I have appeared numerous times before the National Energy Board and the Canadian Radio-Television and Telecommunications Commission («CRTC»). In the U.S. at the federal level, I have testified numerous times before the Federal Energy Regulatory Commission and the Federal Communications Commission. I have also appeared before some 40 state and provincial commissions, including:

Alabama	Illinois	New Brunswick	Pennsylvania
Alaska	Indiana	New Jersey	Québec
Alberta	Iowa	New York	South Carolina
Arizona	Louisiana	Newfoundland	Tennessee
British Columbia	Manitoba	North Carolina	Texas
California	Michigan	North Dakota	Utah

Colorado	Minnesota	Ohio	Vermont
Florida	Mississippi	Oklahoma	Washington
Georgia	Montana	Ontario	West Virginia
Hawaii	Nevada	Oregon	

I was, and continue to be, involved in several landmark proceedings involving the restructuring of the North American electric utility industry, notably in California, Pennsylvania, and Texas. The details of my participation in regulatory proceedings are provided in Exhibit RAM-1.

I was also a consultant on behalf of regulators. I assisted the CRTC for four years in the fields of regulatory finance, applied economics and regulatory policy. I was a consultant for the Ontario Telephone Service Commission (OTSC) to establish procedures for determining the cost of capital for municipal, cooperative, and investor-owned telephone utilities regulated by the OTSC. I have frequently assisted regulatory commissions in matters of regulatory finance and cost of capital methodologies.

BACKGROUND

The North-American energy market is experiencing dramatic change due to growing competition. Competition is present in numerous segments of the energy markets as regulatory barriers are gradually removed. For example, the interconnection of facilities, the unbundling of facility elements and the equal access to networks facilitate competitive entry. Regulatory public policy increasingly encourages customer choice (wholesale and retail wheeling) by requiring utilities to provide wheeling, open access, and connection services. As a result, the number of new entrants and/or the intensity of competition between existing market participants have increased. New participants in the energy markets include non-utility generators, self-generators, independent power producers, power brokers, and energy service companies, ending the era of the vertically integrated monopoly utility and ushering the era of the unbundled utility.

The restructuring of the U.S. electric utility industry has spilled over in the Canadian markets. Canadian electric utilities are also under competitive pressure due to industry restructuring. Any economically viable generator of electricity has or will

have access to the North American transmission grid, leading to a highly competitive energy market. As the transmission, generation and distribution functions of electric utilities become separated, competition will intensify.

The Canadian electric utility industry is in an excellent competitive posture to withstand the restructuring forces in the industry. While there is growing competition in Canada as well as in the U.S., its development is somewhat mitigated by the surplus of generating capacity in many provinces. The lack of interconnection capacity between regions restricts electricity exports and competition further. Moreover, lower hydro-based electricity production costs and a weak Canadian dollar make electricity very competitive. Competition from natural gas is constrained by its high transportation cost.

In the case of Hydro-Québec, the effects of restructuring are mitigated further by several positive factors, including a lower-cost hydro generating base and lower rates, open access to the northeast U.S. electric grid, and excellent storage capacity. Offsetting the company's favorable competitive position are a lower common equity ratio relative to other electric utilities, vulnerability to fluctuating water levels, marginal profitability, low domestic demand growth, competitive export markets, and limited access to export markets.

In response to the emerging competitive pressures in the industry, Hydro-Québec has functionally separated its major activities of generation, transmission, and distribution into separate administrating units. Transmission activities are now housed in a separate administrative entity, TransEnergie. The risk profile of TransEnergie is discussed fully in Section II.

PURPOSE OF TESTIMONY

I have been asked to: 1) conduct an independent appraisal of the fair and reasonable rate of return on the common equity capital («ROE») of Hydro-Québec's electricity transmission operations (TransEnergie) in light of current and prospective capital market conditions, 2) recommend a return on such capital which will be fair to the ratepayer, allow the company to attract capital on reasonable terms, and maintain its financial integrity, and 3) to assess the reasonableness of TransEnergie's requested capital structure.

SUMMARY OF TESTIMONY

I recommend that 10.6% be used for ratemaking purposes for TransEnergie as the return required to attract capital on reasonable terms, maintain financial integrity, and be commensurate with returns on comparable risk investments. My recommendation is derived from cost of capital studies that I performed using the financial models available to me and from the application of my professional judgment to the results obtained, in light of TransEnergie's long-term investment risks and economic environment. I applied various cost of capital methodologies to several surrogates for TransEnergie, including: Canadian energy utilities, transmission-intensive electric utilities, generation divested electric utilities, and regulated natural gas transmission utilities. I have also surveyed the risk premiums allowed by regulators on comparable risk companies as indicators of the appropriate risk premium for the electricity transmission business. I also recommend that a capital structure made up of 32.5% common equity be employed for ratemaking purposes.

TESTIMONY ORGANIZATION

My testimony is organized in five (5) broad sections:

I. Conceptual Background

II. Risk Environment

III. Cost of Capital Estimates

IV. Capital Structure

V. Summary

The first section discusses the theoretical background underlying the various methodologies used in estimating TransEnergie’s cost of equity capital. TransEnergie's risk environment is described in the second section. The third section describes the results obtained from the various cost of capital methodologies. In the fourth section, I

discuss TransEnergie's capital structure. In the final section, the results from the various approaches used in determining a fair and reasonable ROE for TransEnergie are summarized.

I. CONCEPTUAL BACKGROUND

This section of my testimony provides the theoretical background and discusses the methodologies for determining a company's cost of capital and that of its business segments.

I. 1. RISK AND RETURN

The required rate of return on a security is the compensation required by investors for postponing consumption and exposing capital to risk. When investors supply funds to a utility by buying its stocks or bonds, not only are they postponing consumption, giving up the alternative of spending their dollars in some other way, but they are also exposing their funds to risk. Investors are willing to incur this double penalty only if they are adequately compensated. The compensation they require is the price of capital, or rate of return. If there are differences in the risk of the investments, competition among firms for a limited supply of capital will bring different prices. These differences in risk are translated into price differences by the capital markets in much the same way that commodities which differ in characteristics will trade at different prices.

Of course, the required return is not assured. Risk is defined as the variability of outcomes around the expected return. For an undiversified investor who views a security in isolation, the standard deviation of realized returns provides a valid estimate of the security's risk. An underpinning of modern financial theory is that an investor diversifies by combining risky securities into a portfolio such that the risk of the portfolio is less than any of its parts through diversification effects. Diversification reduces portfolio risk because security returns do not move perfectly together. Complete elimination of risk is impossible however since securities all move together to a certain extent because of the influence of pervasive market-wide forces.

According to modern portfolio theory, a security's total risk can be partitioned into "specific risk", the portion unique to the company, and "market risk", the non-diversifiable portion related to the general movement of security markets:

Total Risk = Market Risk + Company-Specific Risk

The core idea of modern finance theory is that investors can eliminate the company-specific risk component by diversifying their portfolios, and should therefore not be rewarded for bearing this superfluous risk. Diversified investors can only eliminate the company-specific component of risk, and cannot eliminate the market risk component, however. Therefore, they are rewarded with higher expected returns for bearing only market-related risk, which is measured by «beta». Beta is the classic measure of market risk, and captures the extent to which a security's returns move in tandem with the returns of the overall market.

Modern financial theory has established that beta is an important determinant of return, and incorporates several economic characteristics of a corporation which are reflected in investors' return requirements.

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 Capital Asset Pricing Model (CAPM) formally quantifies the additional return required for bearing incremental risk, and 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:

EXPECTED RETURN = RISK-FREE RATE + RISK PREMIUM

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

Equation 1 is the CAPM expression which asserts that an investor expects to earn a return, K, that could be gained on a riskless 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 price of risk, $(R_M - R_F)$.

It is well established in academic research that the CAPM produces a downward-biased estimate of equity cost for companies with a beta of less than 1.00. This

literature is summarized in Chapter 13 of Morin, R. A., Regulatory Finance, Public Utilities Report Inc., Arlington, VA, 1994. Expanded CAPMs have been developed which relax some of the more restrictive assumptions underlying the traditional CAPM responsible for this bias, and thereby enrich its conceptual validity. These expanded CAPMs typically produce a risk-return relationship that is "flatter" than the traditional CAPM's prediction, consistent with the empirical findings of the finance literature. The following equation, known as the Empirical Capital Asset Pricing Model (ECAPM) provides a viable approximation to the cost of equity capital estimate suggested by these expanded CAPM models and can also be used to determine the cost of capital: The constant term 'a' is determined empirically.

$$K = R_F + a (R_M - R_F) + (1 - a) \beta (R_M - R_F) \quad (2)$$

With an empirically determined constant of 0.25, equation (2) becomes:

$$K = R_F + 0.25 (R_M - R_F) + 0.75 \beta (R_M - R_F) \quad (2a)$$

I. 2 ROE IN PRACTICE

There are other methodologies that can be applied to measure a fair and reasonable ROE besides the CAPM:

1. Discounted Cash Flow («DCF»)
2. Risk Premium
3. Comparable Earnings

These approaches are described in succinct form in Appendix A, «*A Review of ROE Methodologies*». While, in theory, all the techniques should be employed, more weight should be accorded to the CAPM and Risk Premium methodologies from a practical perspective.

The DCF and Comparable Earnings methodologies are particularly difficult to implement in practice when you are dealing with the fast-changing and fluid circumstances of the Canadian capital markets and of the energy industry. One serious obstacle is that there is only a handful of publicly-traded investor-owned pure-play Canadian electric utilities with adequate historical data, and several Canadian energy

utilities' historical data are distorted by multiple changes in ownership and corporate restructurings. Moreover, several of the energy utilities are thinly traded, endangering the reliability of market-based measures, such as the beta risk measure discussed later. These difficulties are not nearly so acute in the U.S. because of much larger sample size of electric utilities compared to Canada.

There are additional practical difficulties in implementing the DCF at a particular point in time. They are briefly described in a technical supplement to Appendix A. From a purely practical viewpoint, the DCF model is difficult to apply to Canadian electric utilities data. There are very few «degrees of freedom» and very few comparable risk pure-play electric utilities with clean homogeneous historical financial data in Canada, and, therefore, the DCF results are likely to prove unreliable. Also, it is difficult to obtain a meaningful proxy for the perpetual growth component of the DCF model due to the paucity of analysts growth forecasts in Canada. These difficulties are not nearly so acute in the U.S. because of much larger sample size of electric utilities compared to Canada and because of the availability of growth forecasts. Also, these difficulties are somewhat circumvented when applying the DCF model to a market aggregate or to a stock market index or when applying the model over several time periods.

The Comparable Earnings method can be computationally prohibitive and somewhat incompatible with administrative simplicity and streamlined regulation. Should the Régie conclude that the method should still play a role in defining a fair and reasonable ROE, implementation should follow the general directions which I have outlined in Appendix A and which I have described in prior testimonies before the Régie.

Therefore, I have relied principally, although not exclusively, on the CAPM and Risk Premium methodologies. I also examined the risk premiums allowed by North American regulators as a check on my estimates. I have applied the DCF model to U.S. electric utilities as a supplementary check.

I. 3 DIVISIONAL COST OF CAPITAL

Because risk-averse investors require higher returns from higher risk investments, the expected return, or cost of capital, for a higher risk investment exceeds

that of a lower risk investment. Viewing the various unbundled businesses of a vertically integrated electric utility (generation, transmission, distribution) on a stand-alone basis just like any other corporate investment, the higher the risk of that investment, the higher the expected return. In theory, the latter can be calculated for each individual business segment as long as reliable and relevant market and historical information are available on each entity and/or on comparable risk investments which are publicly-traded.

Under the "stand alone" approach, TransEnergie is viewed as an independent operating company, and its cost of equity is inferred as the cost of equity of comparable risk firms. The «stand alone» approach is predicated on the opportunity cost principle of economics, whereby the cost of any resource, including capital, is the cost of an alternative foregone. Therefore, the cost of equity capital is the risk-adjusted opportunity cost to the investors, regardless of their identity. The relevant considerations in calculating TransEnergie's cost of capital are the alternatives available to investors and the returns and risks associated with those alternatives. The identity of a company’s shareholders should have no bearing on its cost of equity because it is the risk to which the company’s equity is exposed which governs its cost of money. Had TransEnergie's stock been widely held by the public, the company would be entitled to a return which would fully cover the cost of both its debt and equity.

To estimate the cost of equity capital for TransEnergie, I have used the Pure-Play methodology. The approach consists of identifying publicly-traded companies which are most similar to the business segment in question, and then applying the traditional cost of capital methodologies to the proxy firms. The average cost of equity for these companies can be used as an estimate of equity cost for the business segment. For example, to the extent that an electricity transmission business such as TransEnergie has a risk profile similar to today’s natural gas transmission business, the betas of natural gas transmission utilities can be used as proxies for the unobservable beta of TransEnergie and inserted into the CAPM to infer the cost of capital for that business.

II. RISK ENVIRONMENT

It is convenient to disaggregate TransEnergie's risk into three broad components: business risk, regulatory risk, and financial risk.

TOTAL RISK = BUSINESS RISK + REGULATORY RISK + FINANCIAL RISK

Business risk refers to the relative variability of operating profits induced by the external forces of demand for and supply of the firm's products, by the presence of fixed costs, by the extent of diversification or lack thereof of services, and by the character of regulation.

Regulatory risk refers to the quality and consistency of regulation applied to a given utility and to the fairness and reasonableness of regulatory decisions.

Financial risk refers to the additional variability of earnings induced by the employment of fixed cost financing, that is, debt and preferred stock capital.

Relative to other Canadian energy utilities, TransEnergie possesses below average business risks, above average regulatory risk and slightly above average financial risks. The net result is that TransEnergie's overall risk is about average, relative to other energy utilities. Each of these risks is addressed in more details below.

II. 1. BUSINESS RISK

Business risk encompasses all the operating factors which collectively increase the probability that expected future income flows accruing to investors may not be realized, because of the fundamental nature of the firm's business. Business risk is due to sales volatility and operating leverage. Sales volatility refers to the uncertainty in the demand for the firm's products due in part to external non-controllable factors, such as the basic cyclicality of the firm's products, the products' income and price elasticity, the amount of competition, the availability of product substitutes, the risk of technological obsolescence, the degree of regulation, and the conditions of the labor and raw materials markets.

The business risk of utilities is assessed by examining the strength of long-term demand for utility products and services. The size and growth rate of the market, the diversity of customer base and its economic solidity, the availability of substitutes and degree of competition, the utility's relative competitive standing in its major markets, including residential, industrial and commercial markets all impact business risk.

Sales volatility is also related to internal or controllable factors. The reactions of a firm's management to the business environment, such as the adoption of a particular cost structure, are important dimensions of business risk. If all operating costs are variable, then operating income varies proportionately to sales variability. If as is the case for utilities, a large portion of costs are fixed, then operating income will be far more volatile than sales. This magnification effect of fixed costs on the variability of operating income is referred to as "operating leverage".

Operating efficiency from the standpoint of cost and quality of service is another factor which may influence a utility's competitive risk exposure. Other examples of internal risk factors include the degree of diversification in the firm's asset structure, managerial efficiency, growth strategy, research and development policies, and competitive posture.

The size of a utility's construction program is also a source of business risk, to the extent that new construction is to meet projected demand, and that the latter is more difficult to forecast than existing demand. This forecasting risk can be compounded by regulatory lag and attrition.

Any factor which complicates the investor's ability to assess future prospects will accentuate business risk and regulatory risk.

All the determinants of business risk discussed above influence TransEnergie's business risk to some extent. However, TransEnergie's future revenues are largely tied to its sales to the distribution unit of Hydro-Québec («Disco»). To the extent that TransEnergie's costs are largely passed on to Disco and rolled in Disco’s costs of service for ratemaking purposes, TransEnergie is relatively shielded from the fate of Disco’s sales volume and is relatively assured of recovering its costs and a fair return on capital invested. This situation is similar to the Canadian gas pipelines whose costs are rolled in their costs of service for ratemaking purposes. Gas pipelines have relatively

little business risk because of the manner in which tolls are set, whereby the demand charge component of rates ensures 100% recovery of fixed costs. As a result, they are shielded from variability in volume of gas deliveries.

Of course, TransEnergie is subject to forecasting risk, to the extent that budgeted forecasts are made prior to regulatory determination of its rates. Potential deviations from expected profitability can occur due to unanticipated increases in costs, such as interest rates and exchange rates. Moreover, TransEnergie operates in a relatively harsh climate, subject to the vagaries of nature. This puts pressure on the physical assets, and requires reasonable access to capital markets at all times. The ravaging ice storms of January 1998, for example, exploded TransEnergie's capital expenditures budget over the next few years following the storm.

The net effect of all these business risk factors is that TransEnergie's business risks are below the utility industry average and similar to those of natural gas pipelines.

II.2 REGULATORY RISK

An important component of business risk for utilities is "regulatory risk". Regulatory risk generally refers to the quality and consistency of regulation applied to a given regulated utility and specifically to the fairness and reasonableness of rate awards. Other determinants of regulatory risk include specific policy parameters such as the average regulatory lag inherent in regulatory procedures in a given jurisdiction, the use of forward vs historical test years, and whether the utility has the opportunity to earn the authorized return .

TransEnergie's regulatory risks are higher than average at the present time, relative to other regulated utilities in Canada. For the first time, the company will be subject to the regulatory scrutiny of the newly formed regulatory body in the province, La Régie de L'Energie du Québec. With a new Régie regulating a previously government regulated large entity like Hydro-Québec, and in the absence of a track record, investors are understandably skeptical and concerned about regulatory policy. For example, will the new Régie continue to adhere to rate of return/rate base regulation in the future, given the change in the operating environment? What kind of incentive-based

regulation will emerge, if any? How will the new Régie react to the threat of bypass in a more competitive environment in terms of pricing and rate design flexibility? Will TransEnergie and Hydro-Québec enjoy fair and reasonable regulatory treatment under the new Régie as was the case for the utilities regulated by its predecessor?

II. 3 FINANCIAL RISK

Financial risk stems from the method used by the firm to finance its investments and is reflected in its capital structure. It refers to the additional variability imparted to income available to common shareholders by the employment of fixed cost financing, that is, debt capital. Although the use of fixed cost capital can offer financial advantages through the possibility of leverage of earnings, it creates additional risk due to the fixed contractual obligations associated with such capital. Debt carries fixed charge burdens which must be supported by the company's earnings before any return can be made available to the common shareholder. The greater the percentage of fixed charges to the total income of the company, the greater the financial risk. The use of fixed cost financing introduces additional variability into the pattern of net earnings over and above that already conferred by business risk.

Variations in operating earnings cause amplified variations in equity returns when debt financing is used. The spread in equity returns is wider in the case of debt financing, and the greater the leverage, the greater the spread and the greater the cost of common equity.

TransEnergie's very high debt ratio makes it particularly vulnerable to financial risk. TransEnergie's high level of financial leverage restricts its interest and fixed-charge coverage ratios. As discussed fully in section IV of my testimony, the company's financial risks are slightly higher than those of other publicly-owned electric utilities who also have a government guarantee of their debt capital, and substantially exceed those of other Canadian investor-owned energy utilities.

The net result of this medley of risk factors is that TransEnergie possesses average total risks. TransEnergie's greater than average regulatory risk and slightly above average financial risks are offset by its below average business risks.

III. RATE OF RETURN ESTIMATES

In view of the practical limitations of the DCF and Comparable Earnings methodologies applied to individual companies at this time, discussed in Appendix A, I have relied principally on the CAPM and Risk Premium methodologies in arriving at my final ROE recommendation. I have performed six risk premium studies. The first two studies deal with aggregate stock market risk premium evidence and the other four deal directly with the energy utility industry. I have also examined the risk premiums allowed by North American regulators as a check on the various risk premium estimates.

III. 1 RISK PREMIUM: CAPM ESTIMATE

Earlier, I discussed the CAPM, which states that the return required by investors, K, is made up of a risk-free component, R_F, plus a risk premium given by $\beta(R_M - R_F)$. To derive the CAPM risk premium estimate, two quantities are required: beta, β, and the market risk premium, $(R_M - R_F)$. For beta, I used 0.65, based on the historical betas of comparable utilities and the betas of electric utilities prior to deregulation. For the market risk premium, I used 6.6%. These inputs to the CAPM are explained below.

III. 1. A Beta Estimates

Because TransEnergie is an administrative unit of Hydro-Québec and neither are publicly-traded entities, beta must be inferred from comparable risk publicly-traded companies. I examined several proxies for TransEnergie beta: publicly-traded Canadian energy utilities, U.S. electric utilities, particularly those with a high component of transmission assets, and natural gas transmission utilities.

I examined the beta estimates reported in the April 2000 edition of the Value Line Investment Survey for Windows for Canadian and U.S. energy utilities. The betas are reported on the table below.

BETAS OF CANADIAN ENERGY UTILITIES

COMPANY	BETA
BC Gas Inc.	0.55
Canadian Natural Resources	0.80
Canadian Utilities 'B'	0.50
Fortis Inc.	0.50
Great Lakes Power Inc.	0.45
N S Power Holdings Inc	0.65
Pacific Northern Gas Ltd.	0.50
TransAlta Corp.	0.75
TransCanada Pipe.	0.70
Westcoast Energy	0.60
AVERAGE	**0.60**

The average beta for the Canadian sample of energy utilities is 0.60. I point out that for those companies for which there is relatively thin trading, such as Fortis, beta estimates are downward biased. This is because observed returns contain stale information about past period returns rather than current period returns.[1] Adjustment for the thin trading effect increases the beta estimate.

Reasonable Canadian publicly-traded substitutes for TransEnergie are TransCanada Pipeline and Westcoast Energy with beta estimates of 0.70 and 0.60, respectively.

I also examined the betas of U.S. electric utilities with a high component of transmission assets. I began with a large sample of 100 publicly-traded electric utilities, I then ranked them in descending order by percentage of assets devoted to transmission operations. The top fifteen (15) companies in terms of relative transmission assets constituted my final sample. Given that the intensity of competition and restructuring in Canada has not yet attained that of the U.S., it is not unreasonable to postulate that TransEnergie's beta comparable to that of the U.S. transmission

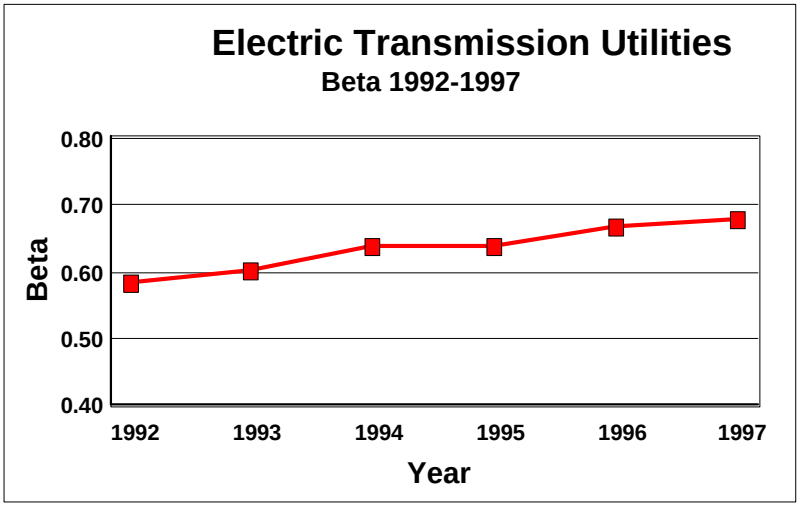
[1] Intuitively, suppose the stock market index surges forward but that an individual company stock price remains unchanged due to lack of trading, the estimated beta is imparted a downward bias. The stock is unable to catch up to market-wide movements and appears to be a lower beta stock.

electric utilities prior to the unleashing of competitive and restructuring forces in the late 1990s. The beta estimates are shown in the table below for 1997 prior to the electric utility industry's massive restructuring which intensified in 1998.

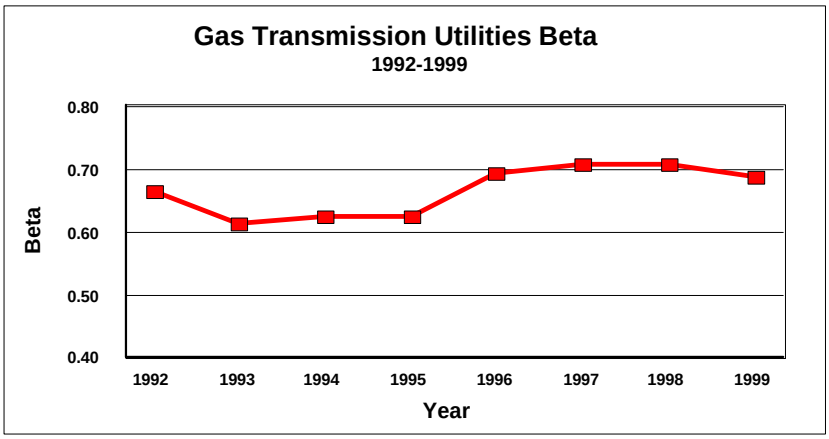
The average beta for the group was 0.66, and steadily increased during the period 1992-1997 prior to formal restructuring from about 0.60 to 0.66, as shown in the first graph below.

BETA ESTIMATES:
TRANSMISSION-INTENSIVE ELECTRIC UTILITIES

COMPANY	BETA
Amer. Elec. Power	0.65
Cen. La. Electric	0.70
Hawaiian Elec.	0.70
Interstate Power	0.55
MDU Resources	0.65
Madison Gas & Elec.	0.55
Montana Power	0.65
New England Elec.	0.70
Northw'n Pub. Serv.	0.65
Otter Tail Power	0.50
PacifiCorp	0.70
Sierra Pacific Res.	0.70
UniSource Energy	0.75
Upper Peninsula Energy	0.75
UtiliCorp United	0.65
AVERAGE	**0.66**

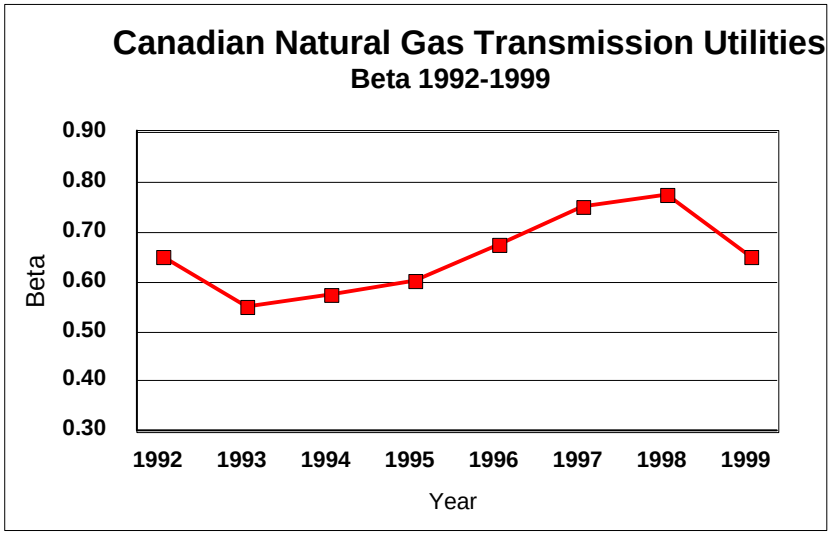


As a third proxy for TransEnergie, I examined the risk statistics for natural gas transmission companies. It is reasonable to postulate that TransEnergie's possesses an investment risk profile similar to today's natural gas transmission utility business. The graph below shows the behavior of beta for a large sample of gas transmission pipelines over the past several years. The beta risk measure for the pipelines has fluctuated narrowly around 0.65 over the period, and is currently 0.70.



The graph below shows the corresponding data for TransCanada Pipelines and Westcoast Energy, the only two pipeline companies covered by Value Line for which

data are available over the same time period. The graph shows an average beta in the range of 0.60 to 0.70 over the period and of 0.65 currently.



I conclude from all these analyses that an appropriate beta for TransEnergie is in the range of 0.60 to 0.70, based on the comparative betas of Canadian energy utilities, transmission-intensive electric utilities prior to restructuring, and natural gas transmission companies. I shall use the midpoint of 0.65 as my estimate for TransEnergie, given that the company's risk profile is average, as discussed earlier.

There is another methodology which can be used to corroborate TransEnergie's beta. Given a company's stock beta ("levered beta") and its equity ratio, an unlevered beta, purged from any financial risk, can be computed. This unlevered beta, or pure business risk beta, measures the business risk component of the firm's total risk, or, alternately, what the company's beta would be in the absence of debt financing (all-equity financing).

The fundamental idea is contained in the following relationship:

$$\text{Unlevered Beta} = \text{Levered Beta} \times \text{Equity Ratio}$$

$$\beta_U = \beta_L \times E/C \qquad (3)$$

where β_U is the unlevered beta, β_L is the levered beta, E is the amount of equity capital, and C is the total capital invested. The ratio E/C is the equity ratio. For example, for a

utility with an equity ratio of 40% and a beta of 0.70, its unlevered beta is 0.70 x 0.40 = 0.28

Exhibit RAM-11 shows the calculation of unlevered betas for Canadian utility companies, given their equity ratio and stock beta. The average unlevered beta, or pure business risk beta, is 0.24, with little variability between companies.

A beta for TransEnergie can be inferred, using the same relationship in reverse. Given TransEnergie's business risk beta and common equity ratio, its stock beta can be computed from equation 3 above. If we make the conservative assumption that TransEnergie's business risk is only 0.17, which is one standard deviation below the Canadian average reported on Exhibit RAM-10 and among the lowest of all Canadian energy utilities, and using Hydro-Quebec's non-consolidated equity ratio of 26.7%, TransEnergie's beta would be 0.17/0.267 = 0.64, which is very close to the beta of 0.65 that I used for TransEnergie and the average beta of utility companies. This confirms the notion that TransEnergie's low business risk is offset by its larger regulatory risk and slightly larger financial risk with the net results that TransEnergie's total investment risk is comparable to the average risk of Canadian energy utilities.

III. 1. B. Market Risk Premium

For the market risk premium component of the CAPM, I used 6.6%. This estimate was based on the results of both forward-looking and historical studies of long-term risk premiums in North American capital markets. Five studies guided the assumed range.

(1) The Hatch-White compilation of historical returns on Canadian securities from 1950 to 1987 shows that a broad market sample of common stocks outperformed long-term Canada bonds by 6.9%, or close to 7%. For reference, see *Canadian Stocks, Bonds, Bills and Inflation: 1950-1987*, James E. Hatch and Robert W. White, The Financial Analyst Research Foundation, 1988.

(2) The annual update to the Canadian Institute of Actuaries study, *Report on Canadian Economic Statistics 1924 - 1999*, shows that the average observed aggregate

risk premium between stocks and long-term government bonds over a very long period is equal to 5.8%.

(3) In U.S. capital markets, the Ibbotson Associates study, *Stocks, Bonds, Bills, and Inflation, 2000 Yearbook*, compiles historical security returns from 1926 to 1999 and shows that a broad market sample of common stocks outperformed long-term U.S. government bonds by 7.8%.

I have employed returns realized over long time periods rather than returns realized over more recent time periods because realized returns can be substantially different from prospective returns anticipated by investors, especially when measured over short time periods. A risk premium study should consider the longest possible period for which data are available. Short-run periods during which investors earned a lower risk premium than they expected are offset by short-run periods during which investors earned a higher risk premium than they expected. Moreover, the use of the entire study period in estimating the appropriate market risk premium minimizes subjective judgment and encompasses many diverse regimes of inflation, interest rate cycles, and economic cycles.

From a statistical viewpoint, to the extent that the historical equity risk premium estimated follows what is known in statistics as a random walk, one should expect the equity risk premium to remain at its historical mean. The best estimate of the future risk premium is the historical mean. Since I found no evidence that the market price of risk or the amount of risk in common stocks has changed over time, that is, no significant serial correlation in either the CIA or the Ibbotson studies, it is reasonable to assume that these quantities will remain stable in the future.

When using historical risk premiums as a surrogate for the expected market risk premium, the only relevant measure of the historical risk premium is the arithmetic average of annual risk premiums over a long period of time. When estimating the cost of capital, only arithmetic means are correct. Looking forward, the expected return is an arithmetic mean. Looking backward, the historical achieved return is a geometric average. In statistical parlance, the arithmetic average is the unbiased measure of the

expected value of repeated observations of a random variable, not the geometric mean. Only arithmetic averages can be used as estimates of cost of capital, and that the geometric mean is not an appropriate measure of cost of capital[2].

(4) For the fourth guide to my chosen range of market risk premiums, I applied a DCF analysis to the aggregate Canadian equity market (Toronto Stock Exchange) using Value Line's "Value Line Investment Survey for Windows 95" («VLIS») software. Excluding high-growth stocks, the dividend yield on the aggregate market is currently 1.5% (VLIS 04/2000 edition), and the projected growth for the Value Line common stocks is in the range of 5.7% to 14.4%. Adding the two components together produces an expected return on the aggregate equity market in the range of 7.2% to 15.9%, with a midpoint of 11.6%. Following the tenets of the DCF model, the spot dividend yield must be converted into an expected dividend yield by multiplying it by one plus the growth rate. This brings the expected return on the aggregate equity market to 11.8%. Recognition of the quarterly timing of dividend payments rather than the annual timing of dividends assumed in the annual DCF model brings this estimate to 12.0%. The implied risk premium is therefore about 6.0% over long-term Canada bonds which are yielding 6.1% currently.

(5) For the fifth guide to my chosen range of market risk premiums, I applied a DCF analysis to the U.S. aggregate equity market using the VLIS software. Excluding high-growth stocks, the dividend yield on the aggregate market is currently 2.6% (VLIS 04/2000 edition) on dividend-paying stocks), and the projected growth for the Value Line common stocks is in the range of 7.2% to 12.1%. Adding the two components together produces an expected return on the aggregate equity market in the range of 9.8% to 14.7%, with a midpoint of 12.3%. Following the tenets of the DCF model, the spot dividend yield must be converted into an expected dividend yield by multiplying it by one plus the growth rate. This brings the expected return on the aggregate equity market to 12.6%. Recognition of the quarterly timing of dividend payments rather than the annual

[2] This is formally shown in Morin, R.A., Regulatory Finance, Public Utilities Report Inc., Arlington, Va., 1994, Chapter 11 and in Brealey, R. and Myers, S., Principles of Corporate Finance, McGraw-Hill, 5th ed., New York, 1997, Chapter 8.

timing of dividends assumed in the annual DCF model brings this estimate to 12.8%. The implied risk premium is therefore 6.7% over long-term U.S. Treasury bonds which are yielding 6.1%.

Recapitulating, the market risk premium estimates from the five studies are as follows:

Historical Hatch-White	6.9%
Historical Cdn. Inst. Actuaries	5.8%
Historical Ibbotson Associates	7.8%
Prospective Value Line Canada	6.0%
Prospective Value Line U.S.	6.7%

Average	6.6%

The average estimate from all the historical and prospective estimates is 6.6%, which is my final estimate of the market risk premium.

Three fundamental premises should guide the decision of how much weight should be given to each of the five studies. In order of importance, they are as follows. First, equal weight should be accorded to historical and prospective risk premium results, whether Canadian or U.S.. Second, more weight should be given to a more statistically reliable study than a less reliable study. Third, Canadian results should take precedence over the U.S. results only if the first two premises have been met. Let us examine the aforementioned studies in terms of those premises.

Historical (realized) risk premiums as well as prospective (expected) risk premiums calculated from a DCF analysis of the overall market provide relevant information to the investor with regard to the market risk premium. Equal weight should be accorded to historical and prospective risk premium results. Each proxy brings information to the judgment process from a different light. Neither proxy is without blemish, each has advantages and shortcomings. Historical risk premiums are available and easily verifiable, but may no longer be applicable if structural shifts have occurred.

Prospective risk premium estimates may be more relevant since they encompass both history and current changes, but are nevertheless imperfect proxies because they rely on forecasts. Therefore, equal weight is to be given to historical and prospective studies, regardless of origin.

Given that equal weight should be accorded to historical and prospective studies, the next question is whether it matters whether such studies are performed using Canadian or U.S. market data. Equal weight should be given to the U.S. risk premium results relative to Canadian risk premiums for four reasons.

1. There is only a small handful of undiversified pure-play electric utilities in Canada whose shares are publicly listed and actively traded, and are therefore subject to the opinions and actions of investors in a measurable way. In contrast, the U.S. electric utility industry is made up of nearly 100 investor-owned electric utilities with market data. Given this situation, the need to extend the very small sample of publicly-traded Canadian electric utilities to include other electric utilities of comparable risk is obvious.

2. Analysts' long-term growth forecasts are widely available for U.S. companies in contrast to Canadian markets where such forecasts are very sparse. It is therefore instructive not only to extend the sample of companies but also to examine the risk premium results for these companies based on the use of such forecasts, which are valid proxies for investors' growth expectations.

3. The prospective risk premium study of the U.S. equity market using the DCF approach was performed on a very large sample of dividend-paying companies, close to 900 companies, in contrast to the same study performed on the Canadian equity market which was made up of only a handful of companies, and several of those did not even have earnings/dividend forecasts. Therefore, the statistical reliability of the U.S. study far exceeds that of the Canadian study.

4. The degree of integration between the Canadian and U.S. capital markets has increased exponentially in recent years, as the barriers to entry in global capital markets have eroded. Canadian investors and analysts do compare U.S. utilities with Canadian utilities when making investment decisions.

Not only is a continental energy market developing, but world financial markets are unifying. A dramatic development of the last decade has been the integration of world financial markets into one global «supermarket». Global corporations and global investors are well-positioned to access this market, and arbitrage short-run disparities in the cost of funds between markets. Their activity tends to drive national capital costs toward a single global standard. When capital flows freely from one location to another, competitive forces of supply and demand will quickly eliminate any price or rate of return disparities, other than those arising from differences in risk. Thus cost of capital differences cannot persist in an integrated capital market. The long-run tendency for real interest rates and exchange rates to revert to parity suggests an integrated capital market. There is considerable evidence that national capital markets remain imperfectly integrated but are converging rapidly toward integration. For example, a December 1992 paper (Mitoo, U.R., "Additional Evidence on Integration in the Canadian Stock Market", Journal of Finance, December 1992) finds strong evidence of an increasing degree of integration over time between the Canadian and U.S. equity markets. The degree of integration has accelerated markedly since that particular study.

Capital markets are radically different now than in the 1980’s and 1990’s. Transactions, diversification, and taxation barriers to investment in foreign securities by Canadian investors have eroded. It is now easier to purchase and sell shares traded on foreign exchanges. More shares of foreign companies are now interlisted on Canadian and US exchanges. The purchase of ADRs and ADSs provides access to equity investments in foreign companies. A wide range of global and regional investment alternatives are available to investors through mutual funds based in Canada and the US.

Foreign content restrictions have been loosened considerably. The level of foreign content permitted in RRSP portfolios is scheduled to rise to 30% next year, which can effectively be increased to over 50% by investing the remaining 70% in shares of mutual funds which in turn have a foreign content of 30%. The introduction of the multi-jurisdictional prospectus for new issues in North American capital markets has facilitated cross-border access to capital by corporations. International communications

networks and equipment have facilitated the access to information on foreign securities. Global diversification is actively promoted by the investment community.

In short, the integration and linkages between the U.S. and Canadian capital markets have greatly solidified in recent years, and U.S. data are clearly relevant to both Canadian and U.S. investors. Of course, Hydro-Québec is an active and large player in world financial markets with some 50% of its debt denominated in U.S. dollars.

The tax differences between Canada and the U.S. do not substantially bias the comparisons between the two markets. The tax regime differentials as between Canada and the U.S. are relatively minor. The statutory federal tax rate on all income is very similar to the tax rate on equity income in Canada. While the dividend tax credit did confer special tax benefits on Canadian investors when it was originally instituted in 1978, successive federal budgets in recent years have diminished the beneficial effects of the dividend tax credit.

The risk similarities between Canadian and U.S. utility stocks far outweigh the remaining dissimilarities in tax regime. Besides, taxes are not relevant for non-taxable investors such as pension funds who conduct a good part of the trading on the market.

Based on the relative statistical reliability of the studies, the high degree of market integration, and the need to weigh both historical and prospective market risk premium data, I have given equal weight to the five market risk premium studies in arriving at my 6.6% market risk premium.

III. 1. C. CAPM Risk Premium Estimate

Using those input values, namely a beta of 0.65 and a market risk premium of 6.6%, my CAPM estimate of TransEnergie's risk premium is 0.65 multiplied by 6.6%, or 4.3%.

III. 1. D. Empirical CAPM Risk Premium Estimate

According to the empirical version of the CAPM discussed earlier and in Appendix A, the cost of equity capital is given by the following expression:

$$K = R_F + 0.25 (R_M - R_F) + 0.75 \beta (R_M - R_F) \qquad (4)$$

Thus, according to the ECAPM, the risk premium is given by $0.25(R_M - R_F) + 0.75\beta(R_M - R_F)$. Inserting the same market risk premium of 6.6% for $(R_M - R_F)$, a beta of

0.65, as was done with the traditional CAPM, my ECAPM estimate of the appropriate TransEnergie risk premium is 0.25 x 6.6% + 0.65 x 0.75 x 6.6%, or 4.9%.

III. 2. RISK PREMIUM: U.S. ELECTRIC UTILITIES

In view of the extreme scarcity of publicly-traded electric utilities in Canada subject to the direct opinions of investors, and the total absence of pure-play electric transmission utilities in Canada, I have examined the risk premiums on securities issued by the U.S. electric utility industries both on a prospective and historical basis. The results of these analyses indicate that the risk premium is in the range of 3.4% - 5.2% for electric utilities. Exhibit RAM-2 shows an average prospective risk premium in the U.S. electric utility industry of 3.4%. Exhibit RAM-3 shows an historical risk premium analysis from 1931 to 1999 of the electric utility industry as a whole, using Moody's Electric Utility Index as an industry proxy. The average risk premium over the period was 5.2%.

III. 3. RISK PREMIUM: U.S. NATURAL GAS UTILITIES

As a proxy for TransEnergie energy transmission operations, I have also examined the risk premiums on securities issued by the U.S. natural gas utility industry both on a prospective and historical basis. These analyses indicate that the natural gas transmission risk premium lies in a range of 3.9% - 5.6%. Exhibit RAM-4 shows an average prospective risk premium in the U.S. natural gas industry of 3.9%. Exhibit RAM-5 shows an historical risk premium analysis from 1955 to 1999 of the natural gas utility industry as a whole, using Moody's Natural Gas Utility Index as an industry proxy. The average risk premium over the period was 5.6%.

III. 4. RISK PREMIUM ESTIMATES: SUMMARY

The table below summarizes the risk premium results from the six risk premium studies.

STUDY	RISK PREMIUM
CAPM	4.3%
ECAPM	4.9%
Electric Util Prospective	3.4%

Electric Util Historical	5.2%
Natural Gas Prospective	3.9%
Natural Gas Historical	5.6%

AVERAGE	4.6%

The average risk premium from the various methodologies is 4.6%.

III. 5. RISK PREMIUM: ADDITIONAL CHECKS

I performed two additional checks on my risk premium estimate of 4.6% for TransEnergie, the first one based on the published academic literature and the other based on past regulatory awards in the energy transmission business.

III. 5. A. Risk Premium: Academic Evidence

The risk premium of 4.6% is reasonably consistent with the published academic literature on the subject. Five published studies of utility industry risk premium are noteworthy:

> Carleton, W.T., Chambers, W., and Lakonishok, J. «Inflation Risk and Regulatory Lag.» Journal of Finance, May 1983. («CCL»)
>
> Brigham, E.F., Shome, D.K., and Vinson, S.R. «The Risk Premium Approach to Measuring a Utility's Cost of Equity.» Financial Management, Spring 1985, 33-45. («BSV»)
>
> Harris, R.S. «Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return.» Financial Management, Spring 1986, 58-67.
>
> Harris, R.S. and Marston, F.C. «Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts.» Financial Management, Summer 1992, 63-70. («HM»)
>
> Maddox, F.M., Pippert, D.T., and Sullivan, R.N. «An Empirical Study of Ex Ante Risk Premiums for the Electric Utility Industry» Financial Management, Autumn 1995, 89-95. («MPS»)

Over the period 1971-1980, and using DCF-style measures of equity returns, CCL found risk premiums of 6.15% and 7.08% over Treasury bond yields for utilities with high and low bond ratings, respectively. Using allowed ROE as a measure of equity return, they found risk premiums between 6.2% and 6.7% for the 1972-1980 period. BSV found an average equity risk premium of 5.13% for the Dow Jones Utility

Average electric utilities for the period 1966-1984. Using an alternate measure of expected growth for the DCF computation of equity returns, they found an average risk premium of 4.75% for the January 1980 - June 1984 period. For the Standard and Poors Utility Index, Harris found an average equity risk premium of 4.81%. Harris' findings were consistent with the HM findings as well. MPS found equity risk premiums of 3.4% for the Value Line electric utilities. Overall, the 4.6% risk premium is reasonably consistent with the academic research on the subject.

III. 5. B. Allowed Risk Premium

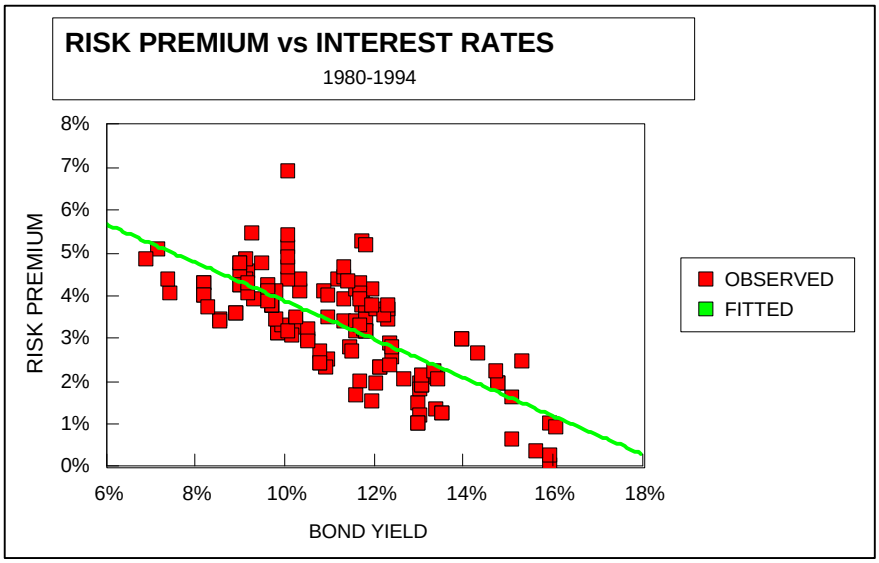
I checked my 4.6% risk premium against past regulatory decisions in both Canada and the U.S.. I examined the risk premiums allowed by Canadian regulators over the period 1980-1994 and their relationship with interest rates. My analysis terminated in 1994 because the National Energy Board adopted a mathematical formula after 1994, and several provincial regulators followed suit. During that time period, the allowed risk premium by Canadian regulators averaged about 4%.

A more careful review of these ROE decisions relative to interest rate trends reveals a narrowing of the risk premium in times of high and volatile interest rates, and a widening of the premium as interest rates fall. For the 1980-1994 period, the following statistical relationship prevailed between the risk premium (RP) allowed by Canadian regulators and the contemporaneous level of interest rates (YIELD):

$$RP = 0.084 - 0.45\ YIELD \qquad R^2 = 0.53$$

(t=-12.6)

The accompanying graph shows the pattern observed for this large sample of 140 regulatory awards. The relationship is statistically very significant as indicated by the R^2 and t-value of the coefficient. The slope coefficient is negative and very close to one-half. This finding implied that for a 100 basis points change in government bond yields, the equity risk premium changes 45 basis points in the opposite direction for a net change of 55 basis points in ROE.

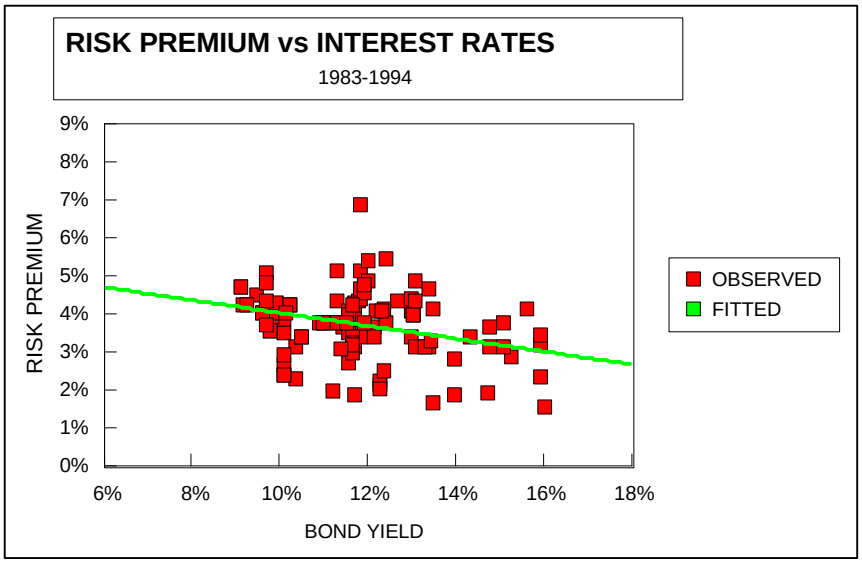


However, if one excludes the decisions from the early 1980s from the period of study, the relationship between the risk premium and interest rates remains negative but is far less sensitive. The accompanying graph shows the relationship over the 1983-1994 period, which excludes the hyperinflation of the early 1980s. For the 1983-1994 period, the following statistical relationship prevailed:

$$RP = 0.070 - 0.31\ YIELD \qquad R^2 = 0.25$$

(t = -6.0)

The relationship remains statistically highly significant as indicated by the R^2 and t-value of the coefficient, the slope coefficient remains negative but is much weaker at 0.30 versus the 0.50 obtained earlier. This result implies that for a 100 basis points change in interest rates, the equity risk premium changes 31 basis points in the opposite direction for a net change of 69 basis points in ROE.



Given that natural gas transmission utilities are reasonable proxies for TransEnergie, I limited the sample to National Energy Board (NEB) ROE orders for Canadian pipelines. The relationship for the overall 1980-1994 period for the 31 natural gas transmission NEB decisions is:

$$RP = 0.085 - 0.49\ YIELD \qquad R^2 = 0.75$$

(t = -9.4)

When the hyperinflationary years of 1981-1982 are excluded, the relationship for the 24 NEB awards becomes:

$$RP = 0.068 - 0.32\ YIELD \qquad R^2 = 0.45$$

(t = -4.2)

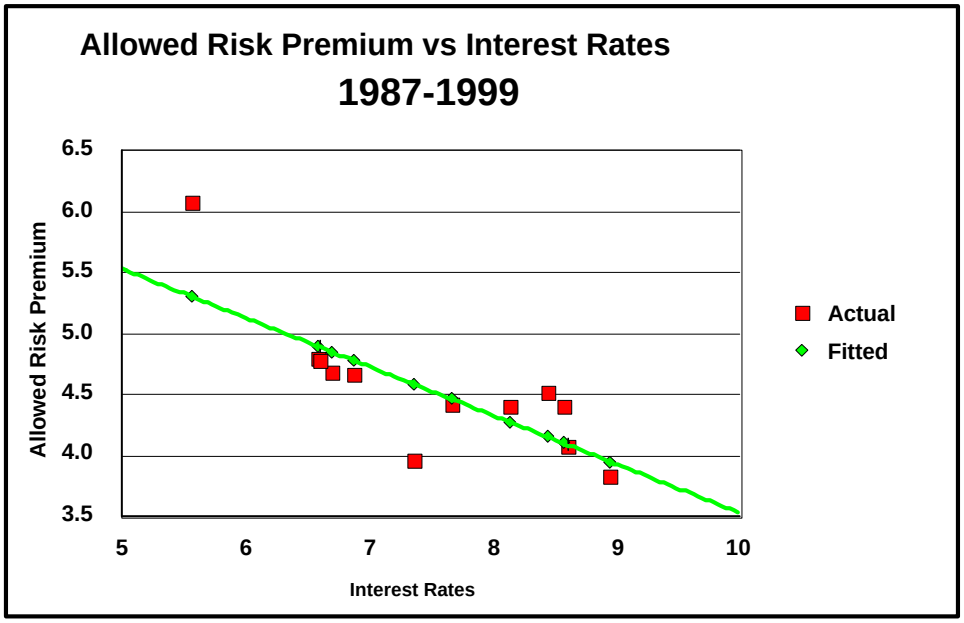
The results are very similar to those obtained earlier for the overall sample of regulatory decisions.

Substituting a risk-free rate of 6.0% in the above relationship, a risk premium of 4.9% is obtained, which slightly exceeds my 4.6% risk premium estimate for TransEnergie. The appropriate risk-free rate is discussed below.

$$RP = 0.068 - 0.32 \times .0600 = .049 = 4.9\%$$

Risk premiums allowed by U.S. regulators behave in a similar fashion. The average risk premium awarded electric utilities over the 1987-1999 period in over 400

regulatory decisions was 4.6%, exactly the same as my recommended risk premium of 4.6% for TransEnergie. The graph below illustrates the relationship between the allowed risk premium and the level of interest rates over the 1987-1999 period for a very large sample of 413 electric utility ROE decisions, the vast majority of which were awarded when electric utilities were regulated vertically-integrated monopolies like TransEnergie.



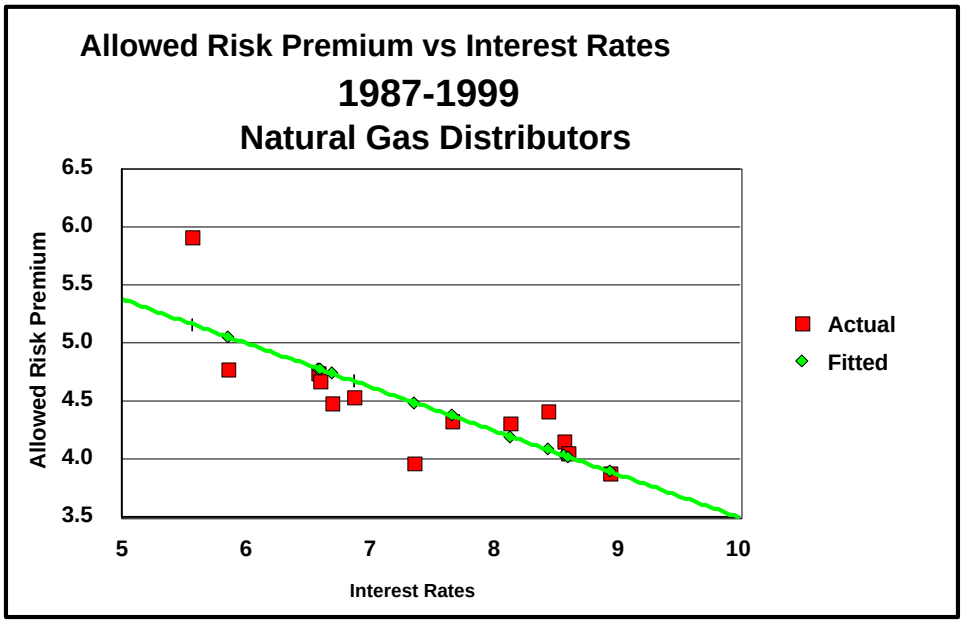
The relationship obtained is very close to the Canadian results:

$$RP = 0.0753 - 0.400\ YIELD \qquad R^2 = 0.63$$
$$(t = -4.31)$$

The relationship is statistically significant as indicated by the high R^2 and statistically significant t-value of the slope coefficient. Substituting a risk-free rate of 6.0% in the above relationship, we obtain a risk premium of 5.1%, which is almost the same as the Canadian estimate of 4.9%:

$$RP = 0.0753 - 0.400 \times .060 = .051 = 5.1\%$$

A similar picture emerges for natural gas decisions. The average risk premium awarded natural gas utilities over the 1987-1999 period in 325 regulatory decisions was 4.5%, very close to my 4.6% recommendation. The graph below illustrates the relationship between the allowed risk premium and the level of interest rates over the 1987-1999 period for a very large sample of 309 natural gas utility ROE decisions.



The relationship between the risk premium and interest rates is very close to the Canadian result and U.S. electric utilities results:

$$RP = 0.0727 - 0.38\ YIELD \qquad R^2 = 0.64$$

(t = -4.4)

Substituting a risk-free rate of 6.0% in the above relationship, we obtain a risk premium of 5.0%:

$$RP = 0.0727 - 0.38 \times .060 = .050 = 5.0\%$$

Therefore, both Canadian and U.S. regulators have allowed risk premiums averaging 4.0% - 4.5% over time. If we adjust for the level of interest rates prevailing at the time of those decisions, the interest-rate adjusted risk premiums are very close to

5.0%. This confirms the conservative nature of my recommended risk premium of 4.6% for TransEnergie.

III. 6. RISK-FREE RATE

To implement the Risk Premium and CAPM methods, an estimate of the risk-free return is required as a benchmark. As a proxy for the risk-free rate, I examined the actual level of long-term Canada (LTC) bond yields prevailing at the end of April 2000 and the consensus forecast of LTC bond yields. The yields on long-term Canada bonds ranged from 5.9% to 6.1%, with a midpoint of 6.0%. The April 2000 issue of Consensus Forecasts shows a LTC 10-year bond yield of 6.2% for April 2001, or about the same yield on 30-year bonds, given the unusually very narrow spread of nearly zero between 30-year and 10-year bonds at this time.

Long-term yields are the relevant benchmarks when determining the cost of common equity, and not short-term interest rates. Short-term rates are volatile, fluctuate widely, and are subject to more random disturbances than are long-term rates. For example, Treasury bills are used by the Bank of Canada as a policy vehicle to stimulate the economy and to control the money supply, and are also used by foreign governments, firms, and individuals as a temporary safe-house for money. Short-term rates are largely administered rates.

As a practical matter, it is inappropriate to relate the return on common stock to the yield on short-term instruments. This is because short-term rates, such as the yield on 90-day Treasury Bills, fluctuate widely leading to volatile and unreliable equity return estimates. Moreover, yields on 90-day Treasury Bills typically do not match the equity investor's planning horizon. Equity investors generally have an investment horizon far in excess of 90 days or one year.

As a conceptual matter, short-term Treasury Bill yields reflect the impact of factors different from those influencing long-term securities such as common stock. The premium for expected inflation embedded into 90-day Treasury Bills is likely to be far different than the inflationary premium embedded into long-term securities yields. On

grounds of stability and consistency, the yields on LTC bonds match more closely with common stock returns.

For purposes of defining a fair and reasonable ROE, I shall use a risk-free rate of 6.0%, which is consistent with the actual and the consensus forecast for long-term LTC bonds. Coupling the 6.0% risk-free rate range with the 4.6% risk premium produces an ROE of 10.6%.

III.7 DCF CHECKS

As an additional check on my ROE recommendation, I applied the DCF model to a proxy for TransEnergie's electricity transmission business: a group consisting of U.S. generation divestiture electric utility companies, that is, those electric utilities that have divested themselves of their generation assets and are pure «wires» businesses.

As explained in Appendix A, to apply the DCF model, two components are required: the expected dividend yield (D_1/P_0) and the expected long-term growth (g). The expected dividend D_1 in the annual DCF model can be obtained by multiplying the current indicated annual dividend rate by the growth factor (1 + g). In implementing the DCF model, I have used the spot dividend yields reported in the April 2000 edition of Value Line Investment Survey and the consensus long-term growth forecast of analysts reported in the Zacks Investment Research Web site. Exhibit RAM-6 displays a group of 13 electric utilities labeled «Generation Divestiture Electric Utilities» by Moody's. These are publicly-listed parent companies whose electric utility operating subsidiaries have divested generation assets or are in the process of doing so and are therefore reasonable proxies for the wires business of an electric utility. As shown on Column 2 of page 1 of Exhibit RAM-6, the average long-term growth forecast obtained from Zacks is 5.7% for this group. Adding this growth rate to the average expected dividend yield of 6.2% shown in Column 3 produces an estimate of equity costs of 11.9% for the group. This result attests to the conservative nature of my 10.6% ROE recommendation for TransEnergie.

IV. CAPITAL STRUCTURE

My recommended return for TransEnergie is predicated on a deemed capital structure consisting of 67.5% debt and 32.5% common equity capital.

I have compared TransEnergie's deemed capital structure with: 1) investor-owned utility capital structures deemed by Canadian regulators, 2) actual capital structures of Canadian energy utilities, both investor-owned and government-owned, and 3) actual capital structures of U.S. energy utilities.

As shown on Exhibit RAM-7, the average deemed common equity ratio of all Canadian energy utilities is 37%, versus Hydro-Québec's consolidated common equity ratio of about 27.7%. The average deemed common equity ratio for electric, gas distribution, and gas transmission utilities is 40%, 37% and 31%, respectively.

Exhibit RAM-8 displays the actual equity ratios for a variety of Canadian energy utilities, as seen by investors. The overall composite average equity ratio is 35%, versus 27.7% for Hydro-Québec.

Exhibit RAM-9 compiles the actual equity ratios for both publicly-owned and investor-owned Canadian electric utilities over the 1992-1998 time period as reported by DBRS in January 2000. The overall composite average equity ratio is 37% as of 1998. For the investor-owned segment, the average is 47%. For the publicly-owned electric utilities, whose debt is unconditionally guaranteed by the provincial government, the average is 31%, higher than TransEnergie's 27.7%. I have excluded Ontario Hydro from the computation of the 1998 average in view of the restructuring of its debt position at that time. I note, however, that a capital structure consisting of 45% common equity is planned for Hydro One Inc., the pure «wires» spin-off electric utility from the former Ontario Hydro.

On the U.S. side of the border, as shown on Exhibit RAM-10 Pages 1-3, the average common equity ratio is 47% for investor-owned gas distributors, 52% for pipelines, and 45% for electric utilities.

Finally, I note that CBRS's published benchmarks for regulated electric utilities include a debt ratio in the range of 50% - 65% (that is, an equity ratio of 35% - 50%) for an A rating, which exceeds TransEnergie's common equity ratio.

In short, TransEnergie's capital structure contains a smaller common equity capital base than Canadian publicly-owned electric utilities, and a substantially smaller common equity base than comparable investor-owned energy utilities. This in turn results in very low interest coverages. Based on the aforementioned comparisons and the need to maintain the company's current bond rating, I consider a common equity ratio in the range of 30% to 35% to be cost efficient and optimal, with a midpoint of 32.5% reasonable for ratemaking purposes.

V. SUMMARY

I was asked to recommend a fair and reasonable return on TransEnergie's common equity capital under current capital market conditions and a fair and reasonable capital structure for ratemaking purposes. I found that a return on equity of 10.6% and a deemed capital structure consisting of 32.5% common equity are fair and reasonable for ratemaking purposes.

To reach that conclusion, I applied various risk premium methodologies to publicly-traded companies which are reasonable surrogates for TransEnergie's electricity transmission operations, including Canadian energy utilities, transmission-intensive U.S. electric utilities, and natural gas utilities. My examination revealed that an appropriate beta for TransEnergie is 0.65, based on the comparative betas of the three proxy groups. To translate the risk estimate into a risk premium estimate, I used the CAPM framework. Using the plain vanilla CAPM, the risk premium implied by TransEnergie's beta of 0.65 and an overall market risk premium of 6.6% is 4.3%. Using the empirical version of the CAPM, the risk premium is 4.9%.

I also applied four risk premium analyses to electric utilities and natural gas utilities, both on an historical and prospective basis. For the electric utilities, I obtained

a risk premium ranging from 3.4% to 5.3%. For the natural gas utilities, I obtained a risk premium ranging from 3.9% to 5.8%.

The table below summarizes the risk premium results from all the risk premium studies. The average risk premium for TransEnergie from the various methodologies is 4.6%.

STUDY	RISK PREMIUM
CAPM	4.3%
ECAPM	4.9%
US Electric Prospective	3.4%
US Electric Historical	5.3%
US Natural Gas Prospective	3.9%
US Natural Gas Historical	5.8%

I performed two additional checks on my risk premium estimate of 4.6% for TransEnergie, the first one based on the published academic literature and the other based on past regulatory awards in the energy transmission business. I found that the 4.6% risk premium is reasonably consistent with the academic research on the subject. I also found that North American regulators have allowed risk premiums averaging around 4% in the past. The allowed risk premium is systematically and inversely related to the level of interest rates, however. Adjusting the risk premium for the level of present interest rates, the indicated risk premium is closer to 5%, attesting to the conservative nature of my estimate.

I then combined the risk premium of 4.6% with a risk-free rate of 6.0% to arrive at an ROE of 10.6%. The risk-free rate of 6.0% is consistent with both actual yields and with the consensus forecast for 30-year LTC bonds.

I have examined the capital structures used for ratemaking purposes of other Canadian utility companies, both investor-owned and publicly-owned. I have also considered the company’s need to preserve flexibility in accessing capital markets on favorable terms, especially during periods of tight credit and adversity and the need to maintain Hydro-Québec's current bond ratings. Maintenance of the current bond ratings is important in order to minimize the cost of debt capital and provide the

company access to the debt markets during periods of instability in the capital markets on reasonable financial terms. Given the capital structures of other utility companies in North America and the need to access the bond markets under favorable terms, I find that a deemed common equity ratio of 32.5% is appropriate at this time.