

**RÉPONSES D'HYDRO-QUÉBEC DISTRIBUTION À LA
DEMANDE DE RENSEIGNEMENTS DE FCEI/UMQ ET OC**

1. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).1
Reference: Dr. Morin, Prefiled Evidence, page 8

Dr. Morin states that 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”.

- (a) Would Dr. Morin please confirm that the academic research that he refers to is based on comparisons of the model’s intercept (risk-free rate) estimate to the realized rate of return on one-month treasury bills and not on a comparison with the rate of return for 10- or 30-year government treasury bonds?
- (b) If his answer to part (a) is that he can not confirm, would Dr. Morin please provide all the references to academic research that he is aware of that compares the model’s intercept estimate to the realized daily, weekly, monthly or annual rate of return on 10- or 30-year government bonds?

Réponse (a) & (b):

The empirical CAPM studies referred to in Dr. Morin’s testimony support the notion that the implied intercept term exceeds the risk-free rate and the slope term is less than predicted by the CAPM. Empirical studies have typically used U.S. 90-day Treasury bill for the risk-free rate and they have laboriously calculated the return on the zero-beta portfolio. Dr. Morin is not aware of any study using 30-year Treasury bond yields for purposes of testing the validity of the CAPM. This is not surprising, given the unavailability of historical 30-year Treasury bond yields over the long periods covered in these studies. Dr. Morin’s own studies described in Appendix C employ long-term bond yields, however.

2. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).2
Reference: Dr. Morin, Prefiled Evidence, page 8

Please provide a copy of Chapter 13 of Morin, R. A., *Regulatory Finance*, Public Utilities Report Inc., Arlington, VA, 1994.

Réponse:

Le chapitre 13 est présenté en annexe 1 au présent document.

3. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).3
Reference: Dr. Morin, Prefiled Evidence, page 13

Dr. Morin states that “[i]t is convenient to disaggregate HQ Distribution's risk into three broad components: business risk, regulatory risk, and financial risk”, and then goes on to discuss each risk. Would Dr. Morin please relate this total risk discussion to the risk that is priced in a market or CAPM framework?

Réponse:

There is a rich empirical literature in finance on the determinants of beta. Variability of cash flows, the use of debt, and growth are perennial members of the family of variables which exert an upward influence on beta. Clearly, the variability of cash flows, and thus beta, increases with demand variability and operating leverage.

Several authors in the finance literature have formalized the joint impacts of risk factors on beta and shown that beta has three main components: demand risk (business risk), operating leverage (business risk), and financial leverage (financial risk):

Beta = Demand risk x Operating leverage x Financial leverage

Demand risk refers to the unanticipated variability in demand and prices, caused by macroeconomic conditions, regulation (regulatory risk), competition, and supply imbalances and to the unanticipated variability in operating and financing costs caused by macroeconomic conditions, regulation, competition, and technological change. Leverage refers to the extent to which these demand and cost uncertainties are magnified by the operating cost and financial cost structures of the company.

Gahlon & Gentry (“On the Relationship Between Systematic Risk and the Degrees of Operating and Financial Leverage”, Financial Management, Summer 1982) demonstrate that beta is a function of the degrees of operating and financial leverage, the variability of the revenues (demand risk, or competition), and the correlation coefficient between the cash flows to the owners and the aggregate dollar return to all capital assets.

Dr. Morin notes that the business risks of electric utilities are not readily diversifiable risks to the extent that they affect all the companies in the energy industry and to the extent that they

affect all industries by virtue of their common dependence on energy as an input to the production process. In other words, they are priced in the CAPM framework.

4. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).4
Reference: Dr. Morin, Prefiled Evidence, page 15

Dr. Morin identifies as a risk facing HQ Distribution: “the obligation ...to purchase power for an unknown and varying group of its ratepayers as a provider of last resort. The latter will result in supply (power procurement) risks”. Please provide examples of all recent instances in which HQ Distribution has actually experienced such risks.

Réponse:

The notion of risk, such as procurement risk, refers to the potential occurrence of an event rather than its actual occurrence. By analogy, the absence of fire, accidental hazard, or liability in the past does not invalidate the potential of such events occurring in the future. Hence, the proliferation of insurance policies against such events.

5. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).5
Reference: Dr. Morin, Prefiled Evidence, pages 15 and 16

Please clarify the time horizons for “the medium term” and “longer term”. Kindly indicate how these horizons compare with the period for which the rate to be determined in this hearing is expected to prevail.

Réponse:

Although there are no rigid rules on this subject, the terminology “short-term”, “medium term”, and “long-term” generally refers to time horizons of less than one year, one to five years, and greater than five years, respectively.

The period over which rates to be determined in this hearing is expected to prevail is not only unknown, but largely irrelevant. Investors have different horizons when purchasing common stock, ranging from short-term traders and arbitrageurs to long-term buy-and-hold investors. The fact remains that common stock has an infinite maturity. The choice of investor holding period is immaterial when valuing securities. The various DCF valuation frameworks are easily extensible over as many periods

as desired. This is shown formally in Dr. Morin's book, Regulatory Finance, Chapter 4. The valuation models employed in finance do not require any specific holding period in order to remain valid and are independent of investor holding period.

6. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).6
Reference: Dr. Morin, Prefiled Evidence, page 17

Please provide all examples of which Dr. Morin is aware of instances of forecasting risk. For each example, kindly explain whether the risk was mitigated by an *ex post* adjustment. In addition, please explain briefly any other techniques of which Dr. Morin is aware that allow utilities to mitigate forecasting risk.

Réponse:

Tel que mentionné dans le témoignage du Dr. Morin, les risques de prévision comprennent :

1. des variations imprévues du prix de la fourniture et du coût du service de transport sur lesquelles le Distributeur n'a pas de contrôle direct;
2. des variations des taux de taxes diverses telles les taxes sur le capital, sur le revenu brut et les taxes foncières rattachées à des décisions prises par les autorités gouvernementales ou réglementaires (faits du prince);
3. des variations des taux d'intérêt ou de change;
4. des écarts imprévisibles de revenus rattachés à une demande plus forte ou plus faible que prévue des suites de la conjoncture économique et /ou du climat.

De ces risques, les seuls pour lesquels Hydro-Québec Distribution propose, à la pièce HQD-3, document 3, des mesures de mitigations, visent les variations hors du contrôle direct du Distributeur des coûts de fourniture, du service de transport et des faits du prince.

7. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).7
Reference: Dr. Morin, Prefiled Evidence, page 17

Please clarify the time horizon over which Dr. Morin expects that HQ Distribution could be at significant risk of market loss to natural gas.

Réponse:

Hydro-Québec Distribution fait face quotidiennement à la concurrence du gaz naturel et au risque de perte de marché au profit du gaz .

Les facteurs entrant dans le choix d'une source d'énergie alternative à l'électricité ou dans la décision d'un client de convertir ses équipements à une autre source d'énergie sont multiples et leur évolution est difficilement prévisible.

Parmi les facteurs principalement considérés, on retrouve le prix de l'énergie alternative, le coût de l'équipement et de la conversion ainsi que les coûts d'entretien des systèmes. Ces facteurs exercent une influence en continu sur les choix de la clientèle et menacent la part de marché du Distributeur en temps réel.

8. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).8
Reference: Dr. Morin, Prefiled Evidence, page 17

Would Dr. Morin please provide the following:

- (a) The percentage of HQ Distribution's sales tied to specific commodity prices for each of the last three fiscal years.
- (b) The percentage of each of the sales in (a) that are hedged using derivative markets or other such hedges?

Réponse (a) & (b):

Les ventes dont le prix est influencé par les variations des prix des denrées sont associées aux contrats particuliers. Le Distributeur est immunisé des manques à gagner et de la volatilité des revenus associés à ces contrats. Parallèlement, les gains ou pertes qui pourraient découler de la mise en place de produits dérivés pour gérer les risques associés à ces contrats ne sont pas imputés au distributeur.

9. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).9
Reference: Dr. Morin, Prefiled Evidence, page 18

Please provide all examples of which Dr. Morin is aware of instances in which “large volume users...bypass the network and or ...seek alternative energy providers”.

Réponse:

Depuis l'ouverture du marché de gros en 1997, les seuls clients ayant le droit de s'approvisionner en énergie auprès d'un autre fournisseur qu'Hydro-Québec Distribution sont les neufs (9) réseaux municipaux et la Coopérative Saint-Jean Baptiste de Rouville. Ces distributeurs desservent quelques 135 000 clients. Jusqu'à maintenant, aucun d'eux ne s'est prévalu de ce droit.

**10. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).10
Reference: Dr. Morin, Prefiled Evidence, page 18**

Dr. Morin notes that “operating leverage” is “especially acute for HQ Distribution”. Would he please provide his calculations on an annual basis for the most recent five-year period, with and without the inclusion of extraordinary operating costs.

Réponse:

L'impact de la structure des coûts sur la volatilité des bénéfices du Distributeur est illustré ci-après.

Les données fournies couvrent les années 2000-2001, 2001-2002 et 2002-2003. Au-delà de ces périodes, l'information n'est pas disponible.

Structure des coûts et résultats financiers

	2000-2001 Réal		2001-2002 Réal		2002-2003 Projeté	
	(GWh)	M\$	(GWh)	M\$	(GWh)	M\$
Ventes, selon HQD-4, doc. 4	153 666	7 850,7	151 410	7 699,0	156 852	8 078,8
Ms: Coûts variables	153 666	4 197,7	151 410	4 099,5	156 852	4 281,6
Achats d'électricité selon HQD-5, doc. 2	153 390	4 150,0	151 134	4 043,5	156 569	4 229,0
Production des réseaux autonomes	276	47,7	276	56,0	283	52,6
Charges directes de production selon HQD-10, doc. 6 p.12		25,7		30,0		27,7
Achats de combustible selon HQD-5, doc.4		22,0		26,0		24,9
Marge brute	0	3 653,0	0	3 599,5	0	3 797,2
Ms: Coûts fixes		4 423,8		4 481,7		4 465,4
Achats des services de transport selon HQD-2 doc. 1		2 241,6		2 312,6		2 312,6
Distribution et services à la clientèle selon HQD-2 doc. 1		2 229,9		2 225,1		2 205,4
Ms: Production des réseaux autonomes		-47,7		-56,0		-52,6
Déficit, selon HQD-4, doc. 4		-770,8		-882,2		-668,2

11. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).11
Reference: Dr. Morin, Prefiled Evidence, page 18

Dr. Morin notes that Standard & Poor's "utilizes a business risk ranking system of 1-10 for utilities whose debt securities it rates".

(a) Would Dr. Morin please confirm that the system is for business risk?

Réponse:

It is confirmed.

(b) Would Dr. Morin please confirm that this ranking is for each utility's own business risk and not the business risk that is priced by equity investors?

Réponse:

For the business risk priced by equity investors, see response to Question No. 3.

12. **FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).12**
Reference: Dr. Morin, Prefiled Evidence, page 19

Kindly provide Dr. Morin's views on whether regulators should consider regulatory risks in their assessment of the business risks facing HQ Distribution.

Réponse:

Investors certainly consider regulatory risk when making investment decisions, as evidenced by the myriad investment services that evaluate such risks (Value Line, Regulatory Research Associates, bond rating agencies, etc.). Regulatory risk is a prime determinant of total investment risk and regulators should certainly consider such risks in their assessment of total investment risk.

13. **FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).13**
Reference: Dr. Morin, Prefiled Evidence, page 19

Would Dr. Morin please provide his business risk ranking for TransEnergie given his statement that "HQ Distribution' business risk is certainly higher than TransEnergie's"?

Réponse:

For a complete assessment of TransEnergie's business risk, see Dr. Morin's testimony in that division's 2000 rate case.

14. **FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).14**
Reference: Dr. Morin, Prefiled Evidence, page 21

Dr. Morin states: "HQ Distribution's very high debt ratio makes it particularly vulnerable to financial risk". Please confirm that this refers to the company's actual debt ratio. If not, please explain the reference. If so, kindly identify any factors of which Dr. Morin is aware that mitigate this risk for HQ Distribution.

Réponse:

The company's deemed common equity ratio has yet to be determined by the Regie, as this is one of the issues to be determined in this proceeding. Reference to the company's thin common equity ratio refers to Hydro-Quebec's actual ratio.

15. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).15
Reference: Dr. Morin, Prefiled Evidence, page 22

Dr. Morin states that he has “employed the common practice of using adjusted betas, rather than raw betas, as recommended in most college-level investment textbooks”. Would Dr. Morin please provide the references to all the college-level investment textbooks that recommend the use of adjusted betas?

Réponse:

The recommended use of adjusted betas is widespread in mainstream investment and corporate finance textbooks. See for example:

- **Brigham, E.F. and Gapenski, L.C., Financial Management: Theory and Practice, 8th ed., Dryden Press, 2002, Chapter 7, page 268.**
- **Damodaran, A., Investment Valuation, Wiley Finance, 2001, pages 186-7.**
- **Damodaran, A., Corporate Finance: Theory and Practice, 2nd ed., Wiley, 2001**

Moreover, as shown in Dr. Morin’s testimony, the betas implied by regulators’ allowed ROEs, are certainly consistent with the use of adjusted betas.

16. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).16
Reference: Dr. Morin, Prefiled Evidence, page 23

Would Dr. Morin please provide the formula used by Value Line to calculate the adjusted betas reported in the May 2002 edition of the Value Line Investment Survey for Windows.

Réponse:

The standard definition of Adjusted Beta used by Value Line is as follows:

$$\text{Adjusted Beta} = 0.3333 + 0.6666 \times \text{Raw Beta}$$

17. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).17
Reference: Dr. Morin, Prefiled Evidence, page 24

Would Dr. Morin please explain why the post-deregulation beta would be expected to be lower than the pre-deregulation beta?

Réponse:

Electric utility stocks have become increasingly driven by industry-specific factors, including corporate restructurings, mergers, asset divestitures, and regulatory change while the overall equity market is volatile and largely driven by technology stocks. The net result of this “distancing” between the electric utility industry and the overall equity market is a downward effect on utility betas, as utility stocks increasingly reflect factors unique to the industry during the transition to a competitive environment. Brigham & Crum (“On the Use of the CAPM in Public Utility Rate Cases,” Financial Management, Summer 1977, 7-15) analyzed the effects of risk non-stationarity on measured betas, hence on cost of capital, and concluded that a random shock that changes the true beta cannot be immediately measured by an estimated beta. For example, rising investor risk perceptions cause a decline in stock prices, which in turn produces low betas.

**18. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).18
Reference: Dr. Morin, Prefiled Evidence, page 24**

Would Dr. Morin please confirm that:

(a) Beta is a relative measure of risk;

Réponse:

It is confirmed.

(b) A different beta value is obtained for each chosen proxy for the market?

Réponse:

It is confirmed.

**19. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).19
Reference: Dr. Morin, Prefiled Evidence, page 25**

Dr. Morin states that an unlevered beta can be calculated using equation (3).

- (a) Would Dr. Morin please confirm that equation (3) is correct as stated?
 (b) Would Dr. Morin please provide the simplifying assumptions that he made to obtain equation (3).

Réponse (a) &(b):

Equation 3 utilized in Dr. Morin's testimony is derived as follows: The beta of a company's assets (left-hand side of the balance sheet) is equal to the weighted average beta of its debt and equity (right-hand side of the balance sheet) with the weights represented by the relative proportions of such financing in the capital structure:

$$BETA_{asset} = BETA_{debt} ((debt / (debt + equity)) + BETA_{equity}((equity/(debt + equity)))$$

If it is assumed that corporate bonds have zero systematic risk, that is, $BETA_{debt} = 0$ in the above equation, then the above equation reduces to:

$$BETA_{asset} = BETA_{equity}((equity/(debt + equity))) \quad (2)$$

Let total capital be denoted by C. It follows that $C = debt (D) + equity (S)$, that is,

$$C = D + S$$

Substituting in equation (2), we get:

$$BETA_{asset} = BETA_{equity} (S/C)$$

Solving for $BETA_{equity}$ in the above equation, we get:

$$\begin{aligned} BETA_{equity} &= BETA_{asset} (C/S) \\ &= BETA_{asset} ((D+S)/S) \\ &= BETA_{asset} (1 + D/S) \end{aligned}$$

which is the equation appearing in Dr. Morin's testimony. If $BETA_{equity}$ and the debt/equity ratio (D/S) are known, the above equation can be solved for $BETA_{asset}$, that is, for the unlevered beta.

20. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).20
 Reference: Dr. Morin, Prefiled Evidence, pages 27 & 28

For one of his historical and prospective risk-premium estimates, Dr. Morin uses the Ibbotson Associates study, *Stocks, Bonds, Bills, and Inflation, 2002 Yearbook*, which compiles historical security returns for the U.S. from 1926 to 2001.

- (a) How does the risk premium estimate for the U.S. obtained from this study using returns from 1926 to 2001 compare with U.S. studies for longer time periods?
- (b) Why did Dr. Morin not use the estimates for the U.S. for longer time periods?

Réponse:

Dr. Morin did not rely on historical studies that reach back prior to 1926. Dr. Morin's major concern with historical data reaching back that far is the questionable reliability of the data. The stock market of the early 1800's, for example, was severely limited, embryonic in scope, with very few issues trading, and few industries represented. Dividend data were unavailable over most of this early period and stock prices were based on wide bid-ask spreads rather than on actual transaction prices. The difficulties inherent in stock market data prior to the Great Depression are discussed in Schwert, G. W., "Indexes of U.S. Stock Prices from 1802 to 1987," Journal of Business, 1990, Vol. 63, no. 3.

**21. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).21
Reference: Dr. Morin, Prefiled Evidence, pages 28 & 29**

Dr. Morin states that: "When estimating the cost of capital, only arithmetic means are correct. Looking forward, the expected return is an arithmetic mean." Would Dr. Morin provide all the evidence that he is aware of for the use of the geometric mean or a weighted average of the arithmetic and geometric means as an expected return proxy when looking forward.

Réponse:

Only arithmetic averages are appropriate in measuring expected return from historical return data. Only arithmetic means are correct for forecasting purposes and for estimating the cost of capital. As demonstrated formally in Chapter 11 of Dr. Morin's book, Regulatory Finance, and in Brealy & Myers' best-selling corporate finance textbook, Principles of Corporate Finance, only arithmetic averages can be used as estimates of cost of capital,

and the geometric mean is not an appropriate measure of the cost of capital. The widely-cited Ibbotson Associates publication also contains a detailed and rigorous discussion of the impropriety of using geometric averages in estimating the cost of capital.

Dr. Morin is not aware of any textbook on finance or scientific journal article which advocates the use of the geometric mean as a measure of the appropriate discount rate in computing the cost of capital or in computing present values. The use of the arithmetic mean appears counter-intuitive at first glance, because we commonly use the geometric mean return to measure the average annual achieved return over some time period. For example, the long-term performance of a portfolio is frequently assessed using the geometric mean return. But performance appraisal is one thing, and cost of capital estimation is another matter entirely. In estimating the cost of capital, the goal is to obtain the rate of return that investors expect, that is, a target rate of return. On average, investors expect to achieve their target return. This target expected return is, in effect, an arithmetic average. The achieved or retrospective return is the 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.

The geometric mean answers the question of what constant return you would have had to achieve in each year to have your investment growth match the return achieved by the stock market. The arithmetic mean answers the question of what growth rate is the best estimate of the future amount of money that will be produced by continually reinvesting in the stock market. It is the rate of return which, compounded over multiple periods, gives the mean of the probability distribution of ending wealth. Only the arithmetic mean is appropriate for calculations of the cost of capital.

While the geometric mean may be an adequate estimate of performance over a long period of time, this does not contradict the statement that the arithmetic mean compounded over the number of years that an investment is held provides the best estimate of the ending wealth value of the investment. The reason is that an investment with uncertain returns will have a higher ending wealth value than an investment that simply earns (with certainty) its compound or geometric rate of return every year. In

other words, more money, or terminal wealth, is gained by the occurrence of higher than expected returns than is lost by lower than expected returns.

In capital markets, where returns are a probability distribution, the answer that takes account of uncertainty, the arithmetic mean, is the correct one for estimating discount rates and the cost of capital.

The following illustration, adapted from Bodie, Kane, and Marcus, Investments, McGraw Hill, 5th edition, Chapter 24, shows why the arithmetic mean is a superior measure of investor expected return than the geometric mean by means of a numerical example. As shown in the table below, consider a stock that will either double in value (return = 100%) with a probability of 0.5, or halve in value (return = -50%) with probability of 0.5.

Outcome	Final Value of \$1 Invested	1-YR Return
Double	\$2.00	100%
Halve	\$0.50	-50%

Suppose that the stock's performance over a two-year period is representative of the probability distribution, doubling in one year ($r_1 = 100\%$) and halving in the next ($r_2 = -50\%$). The stock's price ends up exactly where it started, and the geometric average annual return over the two-year period, r_G , is zero:

$$\begin{aligned}
 1 + r_G &= [(1 + r_1)(1 + r_2)]^{1/2} \\
 &= [(1 + 1)(1 - .50)]^{1/2} = 1 \\
 r_G &= 0
 \end{aligned}$$

This confirms that a zero year-by-year return would have replicated the total return earned on the stock. The expected annual future rate of return on the stock is not zero, however. It is the arithmetic average of 100% and -50%, $(100-50)/2 = 25\%$. There are two equally likely outcomes per dollar invested: either a gain of \$1 when $r=100\%$ or a loss of \$0.50 when $r=-50\%$. The expected profit is $(\$1-\$.50)/2 = \$.25$ for a 25% expected rate of return. The profit in the good year more than offsets the loss in the bad year, despite the fact that the geometric return is zero.

The arithmetic average return thus provides the best guide to expected future returns. As shown in Chapter 11 of Dr. Morin's book, Regulatory Finance, and in Brealy & Myers' best-selling corporate finance textbook, Principles of Corporate Finance, the argument carries forward into multi-period

22. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).22
Reference: Dr. Morin, Prefiled Evidence, page 29

For his fifth guide to his chosen range of market risk premiums, Dr. Morin conducts a DCF analysis using projections (of growth rates etc.) obtained from Value Line's VLIS 05/2002 edition.

(a) What adjustment for optimism bias did Dr. Morin make to the projected growth rate for the Value Line common stocks?

Réponse:

Dr. Morin relied on analysts' growth forecasts because there is an abundance of empirical research which shows the validity and superiority of earnings forecasts to estimate the cost of capital. Published studies in the academic literature demonstrate that growth forecasts made by security analysts are reasonable indicators of investor expectations, and that investors rely on analysts' forecasts. For example, Cragg and Malkiel [*Expectations and the Structure of Share Prices*], Chicago: University of Chicago Press, 1982] present detailed empirical evidence that the average analysts' expectation is more similar to expectations being reflected in the marketplace than are historical growth rates. Cragg and Malkiel show that historical growth rates do not contain any information that is not already reflected in analysts' growth forecasts. A study by Professors Vander Weide and Carleton, "*Investor Growth Expectations: Analysts vs. History*," (The Journal of Portfolio Management, Spring 1988), also confirms the superiority of analysts' forecasts over historical growth extrapolations. Another study by Timme & Eiseman, "*On the Use of Consensus Forecasts of Growth in the Constant Growth Model: The Case of Electric Utilities*," (Financial Management, Winter 1989), produces similar results.

More importantly, analysts with poor track records are replaced by more competent analysts, so that a poor forecasting record by a particular firm is not necessarily indicative of poor future forecasts. In any event, analysts working for large brokerage

firms and financial institutions typically have a following, and investors who heed to a particular analyst's recommendations do exert an influence on the market.

(b) The projected growth rates are for what time horizon?

Réponse:

Five years.

(c) Would Dr. Morin confirm that he used the constant growth version of the Gordon valuation model for his aggregate Canadian equity market calculation? If not, would he specify what DCF model he used?

Réponse:

It is confirmed.

(d) Did Dr. Morin use an equally weighted dividend yield?

Réponse:

Yes.

(e) Did Dr. Morin use an equally weighted projected growth rate for dividends?

Réponse:

Yes.

(f) Would Dr. Morin confirm that the projected growth range of 5.4% to 15.1% is for dividends? If not, would he please detail how he obtained the dividend growth rate?

Réponse:

The 5.4% is the projected growth in dividends and the 15.1% is the projected growth in earnings.

(g) How frequent were nondividend-paying companies in his sample and how did Dr. Morin deal with nondividend-paying companies?

Réponse:

Dr. Morin's DCF analysis of the aggregate equity market focused on all stocks included in the Value Line universes.

- 23. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).23**
Reference: Dr. Morin, Prefiled Evidence, pages 29 & 30

As the sixth guide, Dr. Morin applies a DCF analysis to the U.S. aggregate equity market. Would Dr. Morin please discuss the effect on his expected return on the aggregate equity market of only using dividend-paying stocks covered by Value Line?

Réponse:

Dr. Morin erroneously referred to “5000 dividend-paying stocks covered by Value Line” in his testimony. The term “dividend-paying” should be omitted from this passage. The DCF analysis was performed on the entire aggregate equity market, as proxied by Value Line’s composite of some 5000 companies.

- 24. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).24**
Reference: Dr. Morin, Prefiled Evidence, page 30

Would Dr. Morin please provide the beginning-of-the-year Value Line forecast for that year’s return on the Value Line Composite Index for 1998, 1999, 2000 and 2001? Would Dr. Morin please provide the actual return on the Value Line Composite Index for each of these four years?

Réponse:

Dr. Morin does not have the requested information, and nor did he rely on such information in his testimony. There have been to Dr. Morin’s knowledge no published empirical studies of Value Line’s track record with respect to long-term market performance forecasts. More importantly, the accuracy of such forecasts in the sense of whether they turn out to be correct is not at issue in implementing the DCF model, as long as the forecasts reflect widely held expectations. As long as they are typical and/or influential in that they are consistent with current stock price levels, they are relevant. It is the consensus forecast which is embedded in stock prices which is relevant, not the future as it will turn out to be.

- 25. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).25**
Reference: Dr. Morin, Prefiled Evidence, page 31

- (a) If markets are integrated, does Dr. Morin believe that the nondiversifiable risks are equivalent in magnitude for the U.S. and Canadian market proxies?

Réponse:

Dr. Morin did not investigate the precise degree of integration of domestic securities markets, and nor did he investigate the relative importance of non-diversifiable risks between the U.S. and Canadian markets, as this was not germane to his rate of return determination.

- (b) If his answer to part (a) is yes, would he please explain the rationale for this belief?

Réponse:

See response to Question 25(a).

- (c) If his answer to part (a) is no, would he please explain how this was reflected in his use of U.S. market risk premium for the Canadian market?

Réponse:

See response to Question 25(a).

**26. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).26
Reference: Dr. Morin, Prefiled Evidence, pages 40-41**

Please confirm that in its September 2002 issue, *Consensus Forecasts* reports the following forecasts for the yield on 10-year Government of Canada bonds: 5.2% for December 2002 and 5.7% for September 2003 for a midpoint of 5.45%. Please confirm that as of late November 2002, the yield on 30-year Canada's was approximately 5.50%. Based on these two confirmations, kindly explain Dr. Morin's updated views on the appropriate long-term rate for use in determining HQ Distribution's ROE.

Réponse:

This is confirmed. It is premature to provide an updated recommendation at this time. In order to avoid multiple updates, Dr. Morin will update his rate of return recommendation prior to hearings, if such a revision is warranted, in order to reflect current capital market and risk conditions. Sufficient time will be provided to allow scrutiny of updated results and exhibits.

27. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).27
Reference: Dr. Morin, Prefiled Evidence, page 45

Dr. Morin includes U.S. energy utilities in his comparisons of equity ratios. Does Dr. Morin agree that energy distribution in the U.S. is farther along in the process of deregulation? If not, please explain why not. If so, kindly explain Dr. Morin's view of how greater deregulation affects the amount of equity carried by utilities.

Réponse:

Dr. Morin does not agree with the premise of the question. While the vertically integrated electric utility industry has indeed experienced deregulation, particularly the generation component, the electricity distribution component remains largely a regulated monopoly at this time.

All else remaining constant, the greater the degree of deregulation, the greater the business risk, and, therefore, the greater the need to reduce financial risk and strengthen the balance sheet.

28. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).28
Reference: Dr. Morin, Prefiled Evidence, page 45 and Exhibits RAM 12 -14

Please describe how convertible instruments were dealt with in the calculation of the common equity ratios reported in these exhibits.

Réponse:

Given the relative paucity of convertible securities in utility capital structures, Dr. Morin did not address this issue and relied instead on published debt and equity ratios from bond rating agency reports and regulatory decisions.

29. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).29
Reference: Dr. Morin, Prefiled Evidence, pages 45-46

Dr. Morin notes that HQ Distribution'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". Please explain Dr. Morin's views on whether there is a risk that HQ will be downgraded from its present "A" credit rating.

Réponse:

Dr. Morin does not believe that a downgrading of Hydro-Québec bonds will occur if his ROE and capital structure recommendations are adopted.

30. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).30

Reference: Dr. Morin, Prefiled Evidence, page 46

Dr. Morin refers to “the need to maintain the company’s current bond rating”. Please discuss all difficulties you can identify that have faced Emera in light of its downgrade by S&P to BBB.

Réponse:

Dr. Morin did not investigate the creditworthiness of Emera and the consequences of the downgrade of its bonds. Dr. Morin can only surmise that Emera’s cost of capital will increase as a result of the downgrade and/or the terms under which the company can borrow will worsen. Existing bondholders are likely to have suffered capital losses as the quality of the company’s bonds has deteriorated.

31. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).31

Reference: Dr. Morin, Prefiled Evidence, page 46

Please confirm that in its decision of October 23, 2002, the Nova Scotia Utilities and Review Board declined to increase the allowed equity ratio for Nova Scotia Power above its prior level of 35%. Please compare the degree of business risk of NS Power, an integrated utility, with that of HQ Distribution. Please explain why 35% is not a sufficient equity ratio for HQ Distribution.

Réponse:

The 35% deemed common equity ratio is confirmed, although it is permitted to reach 40%. Dr. Morin also notes that the Nova Scotia Board allowed a return on common equity in the range of 9.9% - 10.4%. Dr. Morin’s views on an appropriate deemed equity ratio in the range of 35% to 40% for HQDIS are fully articulated in his direct testimony.

32. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).32
Reference: Dr. Morin, Prefiled Evidence, Appendix A, page 3

Please discuss the limitations of the constant growth dividend-discount model. Please explain why a multi-stage DCF method of estimating the cost of equity was not used, and what are the limitations of this more realistic model.

Réponse:

The crucial assumptions of the general DCF model are:

- 1. That investors, in fact, evaluate common stocks in the classical valuation framework, and trade securities rationally at prices reflecting their perceptions of value.**
- 2. That investors discount the expected cash flows at the same discount rate K in every future period. In other words, a flat yield curve is assumed.**
- 3. That the K obtained from the fundamental DCF equation corresponds to that specific stream of future cash flows alone, and no other. There may be alternate company policies that would generate the same future cash flows, but these policies may alter the risk of the cash flow stream, and hence modify the investor's required return, K .**

The assumptions of the standard constant growth DCF model are as follows:

- Assumption #1.*** The 3 assumptions discussed in conjunction with the general DCF model still remain in force.
- Assumption #2.*** The discount rate, K , must exceed the growth rate, g . In other words, the standard DCF model does not apply to growth stocks.
- Assumption #3.*** The same growth rate applies to dividend, earnings, and book value, and is constant in every year to infinity.

Some of these assumptions can be quite unrealistic in a given capital market environment. For example, the standard constant growth DCF model assumes a constant market valuation multiple, that is, a constant price/earnings (P/E) ratio. In other words, the model assumes that investors expect the ratio of market price to dividends (or earnings) in any given year to be the same as the current price/dividend (or earnings) ratio. This is unrealistic under current conditions. The inability of the standard DCF model to

account for changes in relative market valuation and the questionable applicability of the model when M/B ratios deviate substantially from 1.00 are additional vivid examples of the potential shortcomings of the DCF model.

The realism of the DCF assumptions is discussed fully in Chapter 9 of Dr. Morin's book, Regulatory Finance, Public Utility Reports Inc., Arlington, Va., 1994. Dr. Morin points out that when applying the DCF model to a large aggregate of common stocks, the degree of reliability is considerably enhanced as individual company errors and anomalies largely offset one another.

The multi-stage version of the DCF model is difficult to apply because it is difficult to find adequate proxies for the input variables, especially the long-term growth component of the second stage.

33. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).33
Reference: Dr. Morin, Prefiled Evidence, Appendix B, page 1:

Would Dr. Morin please provide all the evidence that he is aware of that the impact of diversification and restructuring activities in recent years and the impact of abnormal weather patterns has differed from that in the past?

Réponse:

Dr. Morin does not understand what is meant by “*that the impact of diversification and restructuring...from that in the past*”. It is not at all clear as to what impact(s) the question refers to (bond rating, risk, stock price, relative market valuation, etc.?)

34. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).34
Reference: Dr. Morin, Prefiled Evidence, Appendix B, page 6:

Would Dr. Morin please explain how the application of the DCF model to a broad aggregate of companies mitigates measurement difficulties when the companies are drawn from the same industrial sector?

Réponse:

Confidence in the reliability of the DCF model result is considerably enhanced when applying the DCF model to a large group of companies, such as a market index. Any distortions introduced by measurement errors in the two components of

equity return for individual companies, namely dividend yield and growth are mitigated. Utilizing a portfolio of companies reduces the chance of either overestimating or underestimating the cost of equity for an individual company. For example, in a large group of companies, positive and negative deviations from the expected growth will tend to cancel out owing to the law of large numbers, provided that the errors are independent. The average growth rate of several firms is less likely to diverge from expected growth than is the estimate of growth for a single firm. More generally, the assumptions of the DCF model are more likely to be fulfilled for a group of companies than for any single firm.

35. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).35

Reference: Dr. Morin, Prefiled Evidence, Appendix C, page 2:

Dr. Morin refers to a “comprehensive study of beta measurement by Kryzanowski and Jalilvand” for U.S. utility betas. Would Dr. Morin please summarize the conclusions of this study with regard to the performance of Value Line type of beta adjustments for utilities?

Réponse:

One of the main conclusion is cited in the abstract from the article that reads in part: *“....it was found that..... the ordinary least squares predictor was consistently ranked as one of the poorest bet predictors for all the forecast horizons.”*

Another relevant passage from the article includes:

.... The quality of beta forecasts may be improved by incorporating some characteristics of the true beta’s underlying distribution into the forecast procedure (see, for example, Vasicek and Blume).....”

36. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).36

Reference: Dr. Morin, Prefiled Evidence, Appendix C, page 3:

Dr. Morin examines “the beta risk measure of a sample of distribution electric utilities over the 1992-1997 period”.

(a) Please provide the sample of distribution electric utilities whose beta trend is shown on the graph on this page.

Réponse:

see Exhibit RAM-4

(b) Why do the betas for the electric distribution utilities displayed in the graph shown on this page stop with the year 1997?

Réponse:

The beta estimates are shown in Exhibit RAM-4 for 1997 prior to the electric utility industry's massive restructuring which intensified in 1998. After 1997, the "disconnect" phenomenon documented in the response to Question 17 biased the estimated betas downward.

37. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).37

Reference: Dr. Morin, Prefiled Evidence, Appendix C, page 6:

Would Dr. Morin please provide the theoretical justification for the so-called "empirical CAPM"?

Réponse:

From a theoretical perspective, the exclusion of variables aside from beta would produce a risk return relationship which is flatter than the CAPM prediction and which is more consistent with the empirical version of the CAPM. 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 may be 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.

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- 38. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).38**
Reference: Dr. Morin, Prefiled Evidence, Appendix C, page 6:

What was the long-term treasury bond rate over the period 1926-1984?

Réponse:

Historical government bond yield data are available from the Ibbotson Associates Valuation Yearbook 2002 or from the Cost of Capital Yearbook 2002.

- 39. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).39**
Reference: Dr. Morin, Prefiled Evidence, Appendix C, page 7:

Dr. Morin states that “[m]ost of the empirical studies cited thus far 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”. Would Dr. Morin explain why these studies could not have calculated adjusted betas using the adjustment procedure used by Value Line.

Réponse:

Dr. Morin can only speculate as to the mindset of these early researchers. Perhaps, the literature on adjusted betas was not sufficiently developed at the time when such studies were performed, and/or, the wide use of adjusted betas in the real world of investment management was not as prevalent at that time.

- 40. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).40**
Reference: Dr. Morin, Prefiled Evidence, Appendix C, page 7:

Dr. Morin states that “another empirical investigation of the relationship between return and Value Line adjusted betas was concluded in 2000 by Dr. Morin, and found a statistical relationship that is quite consistent with the general findings of the literature and with the earlier study”. Please provide a copy of the 2000 study by Dr. Morin on the relationship between return and Value Line adjusted betas.

Réponse:

See Appendix C.

41. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).41
Reference: Dr. Morin, Prefiled Evidence, Appendix C, page 8:

Dr. Morin states that a “study of the relationship between return and adjusted beta is reported on Table 6-7 in Ibbotson Associates Valuation Yearbook 2001”. He goes to state that “[y]et another study was recently concluded by Dr. Morin in May 2002 in support of the empirical validity of the CAPM”. Please provide a copy of Table 6-7 in Ibbotson Associates Valuation Yearbook 2001 and all related discussion. Please provide a copy of the May 2002 study by Dr. Morin in support of the empirical validity of the CAPM.

Réponse:
See Appendix C.

42. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).42
Reference: Dr. Morin, Prefiled Evidence, Appendix C, pages 8 and 9:

Please provide the specifics (details) on the regression reported at the bottom of page 8 and top of page 9. This should include estimated coefficients along with their t- or p-values and so forth.

Réponse:
See Appendix C for derivation of ECAPM equation.

43. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).43
Reference: Dr. Morin, Prefiled Evidence, Appendix C, pages 8 and 9:

Dr. Morin states that the “observed intercept is higher than the prevailing risk-free rate of 5.7%”. Please provide the long Treasury rate that corresponds to “the prevailing risk-free rate of 5.7%”?

Réponse:
Historical government bond yield data are available from the Ibbotson Associates Valuation Yearbook 2002 or from the Cost of Capital Yearbook 2002.

- 44. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).44**
Reference: Dr. Morin, Prefiled Evidence, Exhibit RAM-2:

Please indicate how the betas change if 5 years of monthly returns instead of 5 years of weekly returns are used in their estimation.

Réponse:

Dr. Morin relied on the beta estimates provided by Value Line and did not investigate the impact of measuring returns over monthly periods rather than weekly returns as is the Value Line practice. Value Line has deemed it appropriate to utilize weekly returns in measuring historical betas and does not provide beta estimates based on monthly returns.

- 45. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).45**
Reference: Dr. Morin, Prefiled Evidence, Exhibit RAM-1, page 1 of 2:

Please provide the beta risk measures for 1998-2001 for the same utilities.

Réponse:

Beta estimates for 1998-2001 can be obtained from past CD-ROM monthly editions of the Value Line Investment Survey for Windows. Current beta estimates for 2002 are shown in the table below. Several of the electric utilities have disappeared as a result of mergers and acquisitions in the industry.

BETA ESTIMATES		
	Company	2002
1	Bangor Hydro Elec.	na
2	Cen. La. Electric	na
3	Cen. Maine Power	na
4	Cen. Vermont Pub. Serv.	0.50
5	Commonwealth Energy	na
6	Consol. Edison	0.55
7	Empire Dist. Elec.	0.50
8	Enova Corp.	na
9	GPU, Inc.	na
10	Green Mountain Pwr.	0.60
11	Hawaiian Elec.	0.55
12	Madison Gas & Elec.	na
13	Maine Public Service	0.45
14	Nevada Power	na
15	Orange & Rockland	na
16	Puget Sound Energy	0.60
17	Sierra Pacific Res.	0.85
18	UNITIL Corp.	0.40
19	Upper Peninsula Energy	na
20	UtiliCorp United	na

Source: Value Line Investment Survey for Windows, 12/2002

- 46. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).46**
Reference: Dr. Morin, Prefiled Evidence, Exhibit RAM-5, page 1 of 2:

Please explain why values are missing for 1998, 1999 and 2000 for KeySpan Energy.

Réponse:

KeySpan Energy (formerly Brooklyn Union) was created in 5/98 as a result of the merger between Brooklyn Union and Long Island Light Company. Beta estimates for 1998, 1999, and 2000 were considered non-meaningful following the creation of this new entity.

**47. FCEI/UMQ&OptionConsommateurs-HQDIST(RET.).47
Reference: Dr. Morin, Prefiled Evidence, Exhibit RAM-7:**

Please provide the initial and ending compositions, and all composition changes in the Moody's Electric Utility Stock Index over the studied period. Please indicate how utility failures were dealt with in this index.

Réponse:

Dr. Morin does not possess the year to year composition of Moody's Electric Utility Stock Index going back some 70 years, and nor did he rely on this information in his testimony. Moody's (now Mergent) was unable to supply this information to Dr. Morin upon request and nor is such information available on Mergent's commercial Web site.