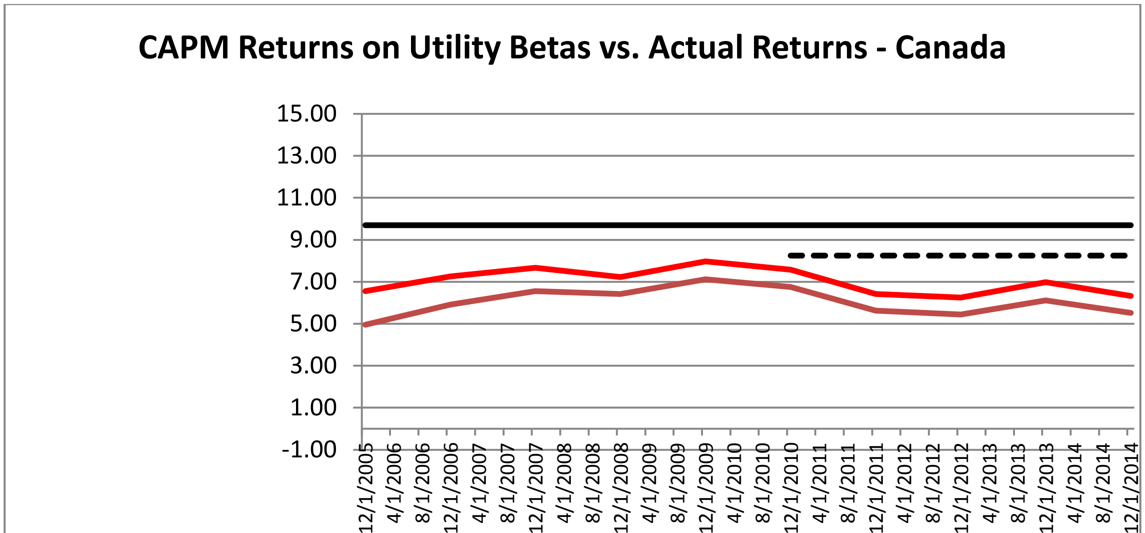
Q. Coyne Evidence: Mr. Coyne states that it is better to adjust betas "for the tendency of beta to revert towards the market average of 1.0 over time." Please provide all evidence that he is aware of that persistently low risk entities, like Utilities, have their beta revert towards 1.0 over time. Is he aware of any empirical research that utility betas revert to 1.0 as he claims?

A. As Mr. Coyne has stated on page 28 of Concentric's report, there are two primary reasons to adjust beta. First, empirical studies provide evidence that beta has a tendency to move towards the market mean of 1.0 over time. That is not to say that they actually become 1.0 or even become the adjusted beta value. The second and potentially the most important reason to adjust beta towards 1.0 is that the error terms on low betas (e.g. below the market mean of 1) tend to underestimate future returns. Conversely, high betas tend to overestimate returns. To determine whether it is appropriate to adjust beta towards 1.0, one should not focus on the betas themselves but the estimated equity returns that are produced from the use of those betas and which better approximates the actual investor returns.

As shown in Mr. Coyne's Exhibit JMC-1, the Canadian S&P/TSX Utilities Index market returns have been 9.69 percent over the last 10 years and 8.25 percent over the last 5 years, well above that which would have been produced by a standard CAPM analysis using prevailing 30-year bond yields, the Duff & Phelps historic market risk premium, and either raw or adjusted betas. The same holds true for the U.S. S&P 500 Utilities Index. Mr. Coyne's analysis is presented below. From this analysis, it is apparent that unadjusted betas do a poor job of projecting the returns they are designed to estimate. Though Mr. Coyne would not rely on the utility index to set returns for an individual utility, the analysis does show that even when applying betas adjusted towards the market mean of 1, modifications must be made to the CAPM to reasonably project utility equity returns.



	12/30/2005	12/29/2006	12/31/2007	12/31/2008	12/31/2009	12/31/2010	12/30/2011	12/31/2012	12/31/2013	12/31/2014
Adjusted Betas Canada	6.33	6.98	6.25	6.42	7.58	7.97	7.23	7.67	7.26	6.55
Raw betas	5.52	6.11	5.44	5.63	6.75	7.12	6.41	6.55	5.92	4.96
10-yr Actual Returns	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69	9.69
5-yr Actual Returns	8.25	8.25	8.25	8.25	8.25					

There have been several studies to support the reversion of beta towards the market mean. In 1971, for example, Blume examined all common stocks listed on the NYSE and found a tendency for a regression of betas towards 1.00, especially for those stocks of companies with the lowest risk profiles, such as utilities. He concluded that:

> …there is obviously some tendency for the estimated values of the risk parameter to change gradually over time. <u>This tendency is most pronounced in the lowest risk portfolios</u>, for which the estimated risk in the second period is invariably higher than that estimated in the first period. There is some tendency for the high risk portfolios to have lower estimated risk coefficients in the second period than in those estimated in the first. Therefore, the estimated values of the risk coefficients in one period are biased assessments of the future values, and furthermore the values of the risk coefficients as measured by the estimates of β_i tend to regress towards the means with this tendency stronger for the lower risk portfolios than the higher risk portfolios.[1] (emphasis added)

In 1975, Blume revisited the topic, measuring the statistical significance of the regression tendency. He concluded:

> A comparison of the portfolio betas in the grouping period, even after adjusting for the order bias, to the corresponding betas in the immediately

[1] Marshall E. Blume, *The Journal of Finance*, Vol. 26, No. 1. (Mar., 1971), at p. 7-8.

> subsequent period discloses a definite regression tendency. This regression tendency is statistically significant at the five percent level for each of the last three grouping periods, 1940-47, 1947-54, 1954-61. Thus, this evidence strongly suggests that there is a substantial tendency for the underlying values of beta to regress towards the mean over time.[2] (emphasis added)

Another form of the CAPM analysis, which is sometimes referred to as the "Empirical CAPM"[3]), can be used in estimating the cost of equity. The Empirical CAPM calculates the product of the adjusted Beta coefficient and the market risk premium and applies a weight of 75% to that result. The model then applies a 25% weight to the market risk premium, without any effect from the Beta coefficient. The results of the two calculations are summed, along with the risk-free rate, to produce the Zero-Beta CAPM result, as noted in the equation below:

$$k_e = r_f + 0.75\beta(r_m - r_f) + 0.25(r_m - r_f)$$

where:

k_e = the required market ROE
β = Adjusted Beta coefficient of an individual security
r_f = the risk-free rate of return
r_m = the required return on the market as a whole.

The Empirical CAPM addresses the tendency of the "traditional" CAPM to underestimate the cost of equity for companies with low Beta coefficients, such as regulated utilities. The advantage of the Empirical CAPM is that it recognizes the results of academic research indicating that the risk-return relationship is different (in essence, flatter) than estimated by the CAPM, and that the "traditional" CAPM underestimates the "alpha," or the constant return term.[4]

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2 Marshall E. Blume, *The Journal of Finance*, Vol. 30, No. 3. (Jun., 1975), at p. 794.
3 *See e.g.*, Roger A. Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 189.
4 *Ibid*., at 191.