1 **Volume 2: Cost of Capital: Expert Opinion of James Coyne- Capital Structure and Risk**
2 **Profile**
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4 Q. Mr. Coyne states (page 43) that *"empirical studies have provided evidence that*
5 *individual company beta is more likely than not to move toward the market average of*
6 *1.0 over time."* **Please provide citations to these studies, references to any graduate**
7 **textbooks in finance that discuss such procedures, and any published work based**
8 **specifically on public utilities. Please indicate if C&T are aware of any published**
9 **research that shows that utility betas do not adjust toward 1.0 and provide the**
10 **relevant citations.**
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12 A. In his study, Dr. Blume found that all Betas, both low and high, revert towards the market
13 mean of 1.0 over time. Dr. Blume specifically studied four groups of Betas, ranging from
14 a very low Beta group (averaging 0.50, similar to the utility industry) to a very high Beta
15 group. Dr. Blume found that his adjustment best predicted future Betas for each of the
16 four risk groups over the next seven years. Dr. Blume found that a low Beta portfolio that
17 averaged 0.50 migrated towards the grand mean of all Betas of 1.0 approximately in
18 accordance with the Blume formula. The study makes obvious that Betas migrate towards
19 1.0 and do indeed exceed their long-term unadjusted averages. Given that the purpose of
20 estimating the CAPM relying on these Beta estimates is to estimate the forward-looking
21 cost of capital, it is important to reflect a forward view of Beta and its tendency to
22 migrate towards the market mean over time.[1]
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24 Concentric agrees with the adjustment methodology employed by the premier Beta
25 providers (i.e., Value Line, Bloomberg) that the appropriate Beta adjustment (especially
26 for utility stocks) is toward the market mean of 1.0. Further, Concentric is not aware of a
27 single U.S. state or federal regulatory jurisdiction that takes exception with the use of this
28 adjustment methodology. Concentric has only encountered this discussion around Beta
29 adjustment methodology in Canadian regulatory proceedings where intervenors, such as
30 Dr. Booth, have challenged the widely accepted findings of the Blume study.
31
32 In Concentric's experience, the Value Line and Bloomberg methodologies are widely
33 accepted and utilized by financial analysts, investors, corporations, and broadly accepted
34 by U.S. regulatory commissions. The Brattle Group summarized this widely-adopted
35 methodology in its report for the BCUC:
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37 *Beta estimates are provided by many data services for Canadian, American*
38 *and other traded companies. The most common methodology to estimate*
39 *Betas is to use the most recent five years of weekly or monthly return data.*
40 *These Betas may then be adjusted towards one as adjustment for sampling*

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[1] Commonly referred to as the "Blume Adjustment" for papers written by Marshall Blume documenting evidence of autoregressive properties of Beta towards the market average of 1.0. See Marshall E. Blume, *On the Assessment of Risk, The Journal of Finance, Vol. XXVI, No. 1* (March 1971) and Marshall E. Blume, *Betas and Their Regression Tendencies, The Journal of Finance, Vol. XXX, No. 3* (June 1975), where Blume found that there was strong evidence that Beta regressed toward the market mean, and that tendency was strongest in the case of the lowest risk portfolios.

1 *reversion that was first identified by Professor Marshall Blume (1971,*
2 *1975).*[2]
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4 Dr. Fernandez has conducted a series of surveys on the use of Betas by finance
5 professors. His survey, most recently updated in 2019, was sent via email to
6 approximately 8,000 finance and economics professors with email addresses "obtained
7 from previous correspondence, papers, and webs of the universities." The survey sought
8 to understand whether professors use Beta to calculate the required return to equity, and
9 "how the number was justified." Dr. Fernandez published the most recent update to his
10 series of Beta surveys in May 2019. The Fernandez survey and analysis indicates that at a
11 minimum, historic calculated Betas should be adjusted to the market mean of 1.0 to better
12 reflect actual returns, because he found that the market return Beta of 1.0 provided the
13 highest correlation to actual returns.
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15 *Historical betas are not meaningful to calculate the required return on*
16 *equity. First, because they change dramatically from one day to the next;*
17 *second, because very often we cannot say with confidence that the*
18 *calculated beta of a company is smaller or bigger than the beta of another;*
19 *third, because historical betas do not make much sense in many cases: high-*
20 *risk companies very often have smaller historical betas than low-risk*
21 *companies; fourth, because historical betas depend very much on which*
22 *index, on which data frequency and on which time interval we use to*
23 *calculate them; fifth, because beta = 1 works better than calculated betas.*[3]
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25 The Corporate Finance Institute, which provides on-line training for finance
26 professionals, and is the provider of the Commercial Banking & Credit Analyst
27 certification program, explains this issue in this manner:
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29 *Why Adjust Betas Towards One?*
30 *Research suggests that, over time, there is a general tendency for* **betas of**
31 **all companies** *to converge towards one. Intuitively, it should not be*
32 *surprising. Because most companies tend to grow in size, become more*
33 *diversified, and own more assets, over time, their beta values fluctuate less,*
34 *resulting in beta mean reversion.*[4] (emphasis added)
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36 In addition to Dr. Blume's research, other academic theorists have also provided support
37 for adjusting utility betas toward the market mean of 1.0. For example, in his book, *New*
38 *Regulatory Finance*, Dr. Roger Morin also supports the use of adjusted betas as follows:

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[2] The Brattle Group, *Survey of Cost of Capital Practices in Canada*, Prepared for the British Columbia Utilities Commission, May 31, 2012, at 15-28.

[3] Betas used by Professors: a survey with 2,500 answers, Pablo Fernandez, Professor of Finance, IESE Business School, University of Navarra, Madrid, Spain. e-mail: fernandezpa@iese.edu, May 28, 2019.

[4] https://corporatefinanceinstitute.com/resources/knowledge/trading-investing/adjusted-beta/

1   *The tendency of true betas to not only vary over time but to move back*
2   *toward average levels is not surprising. A company whose operations*
3   *make the risk of its stock divergent from other companies is more likely to*
4   *move back toward the average than away from it. Such changes in beta*
5   *values are due to real economic phenomena, not simply to an artifact of*
6   *overly simple statistical procedures.*
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8   *Because of this observed regressive tendency, a company's raw*
9   *unadjusted beta is not the appropriate measure of market risk to use.*
10   *Current stock prices reflect expected risk, that is, expected beta, rather*
11   *than historical risk or historical beta. Historical betas, whether raw or*
12   *adjusted, are only surrogates for expected beta. The best of the two*
13   *surrogates is adjusted beta.*[5]
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15 Moreover, Dr. Morin observes that in addition to compensating for the negatively biased
16 error terms for low betas, "raw" beta tends to underestimate the risk of utilities due to the
17 inability to recognize interest rate risk in the calculation of beta for interest-rate sensitive
18 firms. Dr. Morin explains:
19
20   *There is additional economic justification for the use of adjusted betas in*
21   *the case of regulated utilities. Adjusted betas compensate for the tendency*
22   *of regulated utilities to be extra interest-sensitive relative to industrials. In*
23   *the same way that bond holders get compensated for inflation through an*
24   *inflation premium in the interest rate, utility shareholders receive*
25   *compensation for inflation through an inflation premium in the allowed*
26   *rate of return. Thus, utility company returns are sensitive to fluctuations in*
27   *interest rates. This is because the market index typically used in estimating*
28   *betas is a stocks-only index, such as the S&P 500. A focus on stocks alone*
29   *distorts the betas of regulated companies. The true risk of regulated*
30   *utilities relative to other companies is understated because when interest*
31   *rates change, the stocks of regulated utilities react in the same way as*
32   *bonds do. A nominal interest rate on the face value of a bond offers the*
33   *same pattern of future cash flows as a nominal return on a book value rate*
34   *base. Empirical studies of utility returns confirm that betas are higher*
35   *when calculated in a way that captures interest rate sensitivity. The use of*
36   *adjusted betas compensates for the interest sensitivity of regulated*
37   *companies.*[6]
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39 Finally, Mr. Coyne is aware of a series of articles published in the 1970s that addressed
40 the challenges associated with estimating the cost of capital for utilities using the CAPM.
41 The model was relatively new as a regulatory tool in that period, and it engendered
42 interest from both academics and practitioners. Professors Brigham and Crum
43 summarized the lay of the land in their 1977 article *On the Use of the CAPM in Public*
44 *Utility Rate Cases:*

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[5]   Roger A. Morin, Ph. D., *New Regulatory Finance*, Public Utilities Reports, Inc., (2006) at 73.
[6]   *Ibid*, at 74.

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Since its first appearance in 1964, the Capital Asset Pricing Model (CAPM) has received increasing attention in finance. Most of the work on the CAPM to date has been "academic" in the sense that it has involved either tests or theoretical extensions of the basic market model. However, the model has also been used with apparently good results for portfolio decisions, and it has recently been applied in a number of public utility rate cases.

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There are a number of problems with the model, including the following: 1) the model is based on a set of unrealistic assumptions, 2) there is disagreement over the most appropriate interest rate to use as the risk-free rate, 3) the market risk premium cannot be measured with precision, and 4) not only is an individual stock's historic beta unstable, but also no one knows how to estimate a stock's future beta coefficient, which is the one that is relevant in the CAPM.[7]

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This article was one of many that touched on the challenges of estimating the CAPM, and engendered many responses from the academic community. One of these articles, published in 1990, addressed the issue of utility betas and whether they reverted to the market mean. This article published by Gombola and Kahl was narrowly focused on one utility, Consolidated Edison, and responded to the prior article published by Brigham and Crum which described the challenges associated with estimating the cost of capital for utilities using the CAPM. Among the authors' conclusions were:

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Typical adjustment models use a prior estimate of about 0.35 for the adjustment rate toward the underlying mean and a prior estimate of 1.0 as the underlying mean. The results of this study indicate that and underlying mean of 1.0 is too high for most utilities and an adjustment factor of 0.35 is too low.

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And:

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For Consolidated Edison, and underlying mean of 0.7 would be more appropriate.[8]

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While Mr. Coyne is aware of this article, he is not aware of any regulator or provider of data services to investors who have embraced its findings or changed their use of the commonly accepted Blume adjustment methodology as a result.

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[7] Financial Management, Vol. 6, No. 2, pp. 7-15.
[8] Time-Series Processes of Utility betas: *Implications for Forecasting Systematic Risk*, Michael J. Gombola and Douglas R. Kahl, Financial Management, 1990.