ASSOCIATIONS EXHIBIT NO. A-1

STATEMENT OF BRADFORD CORNELL, PH.D.

I, Bradford Cornell, Ph.D., hereby state:

I make this statement in support of the comments submitted by the Aluminum Association, American Chemistry Council, American Forest and Paper Association, American Public Power Association, Electricity Consumers Resource Council, Industrial Energy Consumers of America, National Rural Electric Cooperative Association, and Transmission Access Policy Study Group (collectively, "Associations") to *Inquiry Regarding the Commission's Policy for Determining Return on Equity*, 166 FERC ¶ 61,207 (2019) (the "NOI"). I have personal knowledge of the matters stated herein.

I am currently Emeritus Professor of Finance at Anderson Graduate School of Management at the University of California, Los Angeles. Previously, I was a Visiting Professor of Financial Economics at the California Institute of Technology and I was a Professor of Finance and Director of the Bank America Research Center at the Anderson Graduate School of Management at the University of California, Los Angeles for 26 years.

I earned a master's degree in Statistics from Stanford University in 1974 and earned my doctorate in Financial Economics from Stanford in 1975. I have served as an editor of numerous journals relating to business and finance and have written more than 120 articles and three books on finance and securities: *Corporate Valuation: Tools For Effective Appraisal and Decision* Making (1993), published by McGraw-Hill, *The Equity Risk Premium and the Long-Run Future of the Stock Market* (1999), published by John Wiley and Sons, and *Conceptual Foundations of Investing* (2018), published by John Wiley and Sons. To complement my academic writing, I have also authored articles published in the Wall Street Journal and the Los Angeles Times.

In 1988, I was cited by the Financial Management Association as one of the ten most prolific authors in the field of finance. I have received prizes and grants from my research from the Chicago Board of Trade, The Chicago Mercantile Exchange, and the Institute for Quantitative Research in Finance. My article, "Corporate Stakeholders and Corporate Finance," received the 1987 Distinguished Applied Research Award from the Financial Management Association. In 1999, I was awarded the Institutional Brokers' Estimate System ("I/B/E/S") prize for empirical work in finance and accounting (with Wayne Landsman and Jennifer Conrad). I received a Graham and Dodd Scroll Award in 2006 from the Financial Analyst Society with Richard Roll for our work on delegated agent asset pricing theory. I won this award again in 2011 for my work on economic growth and equity investing. My paper entitled "Luck, Skill, and Investment Performance" in The Journal of Portfolio Management won an Outstanding Article prize from the 11th Annual Bernstein Fabozzi/Jacobs Levy Awards. I won this award again in 2015 for my article "Tesla: Anatomy of a Run Up" (with Aswath Damodaran) and a third time in 2017 for my article, Does Past Performance Matter in Investment Manager Selection (with Jason Hsu and David Nanigian).

I have served as a Vice President of the Western Finance Association. I am also a past director of both the American Finance Association and the Western Finance Association. I have served as an associate editor on numerous journals including The Journal of Finance, The Journal of Futures Markets, The Journal of Financial Research, and The Journal of International Business Studies. I have served as a reviewer of nearly a dozen other professional journals.

My teaching and writing have focused on a number of different financial and economic issues, many of which are relevant to the subject matter of this statement. I currently teach

Applied Corporate Finance and Investment Banking at Caltech. Examples of other classes I have taught over the course of my academic career include Corporate Valuation, the Law and Finance of Corporate Acquisitions and Restructurings, Corporate Financial Theory, Security Valuation and Investments, and Applied Corporate Finance and Investment Banking.

I also provide fundamental valuation analysis as a senior advisor to Rayliant Global Advisors and the Cornell Capital group. In this capacity, I am a registered Investment Adviser Representative.

I have served as a consultant and have given testimony for both plaintiffs and defendants in a variety of securities, regulatory, and commercial lawsuits. During my many years of experience as an expert witness and consultant, I have provided economic analyses and expert testimony (again, for both plaintiffs and defendants) related to valuation, corporate finance, portfolio management, and damages issues. I have been engaged as a damages expert in numerous high-profile cases that revolved around complex financial and securities transactions. My work in valuation has also been cited and relied upon by the Delaware Court of Chancery and the Delaware Supreme Court.[1]

My background is described more fully in my curriculum vitae, which is attached as Appendix A. A list of my publications may also be found in Appendix A. A list of testimony I have given in deposition or at trial over the past four years may be found in Appendix B.

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[1] *See, e.g., Delaware Open MRI Radiology Associates, P.A. v Kessler*, 898 A.2d 290, 331 n.102 (Del. Ch. 2006); *Andaloro v. PFPC Worldwide*, C.A. No. 20336, C.A. No. 20289, 2005 Del. Ch. LEXIS 125, at *71 n. 75 (Del. Ch. August 19, 2005); *In re Appraisal of Dell Inc.*, C.A. No. 9322-VCL, Memorandum Opinion (Del. Ch. May 31, 2016); and *ACP Master, LTD. v ClearWire Corporation*, Memorandum Opinion (Del. Ch. July 21, 2017).

I have been asked by counsel for the Associations to respond to various questions included in the NOI. I have organized this statement to track the NOI outline. Note, however, that I do not address all the questions in the NOI and in some cases questions have been combined to improve the exposition. I directly address the following NOI Questions:

- E1–E8 and E11, concerning the choice among possible financial models;
- F2 and F4–F5, concerning book values and market/book ratios;
- H2.a.1–5, concerning the DCF model;
- H2.b.1–4, concerning the CAPM model; and
- H2.c.1–2, concerning the Expected Earnings model.

My principal recommendations are that the Expected Earnings model not be used and that the specification of the DCF and CAPM models account for long-term limits to growth.

E1. What models do investors use to evaluate utility equities?

Investors are highly heterogeneous, so identifying which models investors use to evaluate utility equities cannot be answered in an unambiguous fashion. The manner in which investors determine their required rate of return on equity for utilities is likewise highly heterogeneous. However, surveys conducted in October 2010 and July 2013 by the Association for Financial Professionals ("AFP") found that 79% and 85% of respondents in 2010 and 2013 respectively used discounted cash flow techniques for investment valuation generally,[2] and found that the Capital Asset Pricing Model ("CAPM") is the most frequently used model for estimating a firm's cost of equity for all industries. The 2010 survey reported that 87% of respondents used the

[2] 2011AFP Current Trends in Estimating and Applying the Cost of Capital: Report of Survey Results, March 2011, Association for Financial Professionals ("AFP 2010 Survey"); and 2013 AFP Estimating and Applying Cost of Capital: Report of Survey Results, October 2013, Association for Financial Professionals ("AFP 2013 Survey").

CAPM. This percentage changed to 85% in the 2013 survey. The Dividend Discount Model (referred to by the Commission and below as the DCF model, for Discounted Cash Flow) was used by 3% of respondents in 2010 and 4% in 2013. The only other model individually identified by the AFP surveys was the Arbitrage Pricing Model (a "factor model," as I will discuss later), which was used by 1% of respondents in 2010 and 2% in 2013. In both 2010 and 2013, 9% of respondents indicated using other, unnamed models.

The academic literature is consistent with the AFP surveys' results. In the academic literature, there are two classes of models; the DCF model and various asset pricing models. The CAPM and various factor models, including the Arbitrage Pricing Model and the Fama-French model, are asset pricing models. Leading textbooks such as Damodaran; Bodie, Kane and Marcus; Reilly and Brown; and Holthausen and Zmijewski describe the CAPM and DCF models in detail.[3] Both of these models have been established for at least half a century and are widely used in practice. Until a consensus has been established regarding the use and specification of factor models or other alternative asset pricing models, I suggest using only these two models.[4] Both the CAPM and the DCF model should work relatively well in the case of utilities as they typically have relatively stable earnings, relatively stable and sustainable growth rates, low firm-

[3] Damodaran, Aswath, 2012, *Investment Valuation*, Wiley, New York, NY; Bodie, Zvi, Alex Kane and Alan J. Marcus, 2018, *Investments*, McGraw-Hill, New York, NY; Reilly, Frank, K. and Keith C. Brown, 2012, *Investment Analysis and Portfolio Management*, South-Western, Mason, OH; Holthausen, Robert W. and Zmijewski, Mark E., 2019, *Corporate Valuation Theory, Evidence & Practice*, Cambridge Business Publishers, LLC.

[4] In my view, it also would not be unreasonable for the Commission to continue using DCF alone, as a matter of continued adherence to an established agency practice that has been judicially reviewed and approved. However, that would be a judgment based more on legal than financial analysis grounds. A potential third method, "Risk Premium," is based on comparing and combining market-based bond yields and regulators' past estimates of the cost of equity. It is being addressed by another expert sponsored by Associations in this proceeding, namely Michael Gorman.

specific volatility, more-predictable dividends, and more limited use of stock buybacks.

In regard to what the Commission calls the "Expected Earnings" model, it is important to distinguish between analyzing expected earnings and the book value of a firm in relation to an investment decision and using the Expected Earnings model (i.e., the anticipated ratio of earnings to book value, "E/B") to estimate the cost of equity capital. Investors routinely forecast expected earnings and analyze a firm's financial statements, including a firm's book value, in making investment decisions. However, forecasting expected earnings and analyzing the book value of a firm is not the same as using the Expected Earnings model to estimate the cost of equity capital.

The academic literature does not endorse the Expected Earnings model as a procedure for estimating the cost of equity capital, because it is based on accounting measures rather than economic measures. Because it is an accounting-based method, it does not give a meaningful estimate of the rate of return that investors require to be attracted to invest in utilities' market-priced equities. None of the leading textbooks recommend using an accounting based Expected Earnings model to estimate the required equity return.

E2. What role do current capital market conditions play in the choice of model used by investors to evaluate utility equities?

As noted above, investors are highly heterogeneous, so the models used by investors to evaluate utility equities cannot be answered in an unambiguous fashion. The same is true of the role that current capital market conditions play in investors' choices among available models. However, the DCF model, CAPM, and factor models are designed to take account of current capital market conditions. As long as current inputs are used, the models will reflect current

market conditions. In the case of the CAPM, this preferably means using the long-term Treasury rate observed on the appraisal date and using estimates for Beta and the equity market risk premium based on information available as of that date.[5] In the case of the DCF model, this preferably means using the stock price set as of the appraisal date and dividend growth expectations as of that date.[6] If such current inputs are used, further adjustments are unnecessary and are likely to lead to estimation errors because they introduce ad hoc changes into the models.

In short, I am not aware of evidence demonstrating that investors' model choices vary with capital market conditions, and there is no basis in academic theory for such variation. In my opinion, any assertion that either the CAPM or DCF model receives less investor credence because of current capital market conditions than they did formerly is baseless.

E3. Are any models thought to be superior or inferior to others? If so, why?

Within the classes of asset pricing models, there is a long and ongoing debate in the academic community regarding whether to use the CAPM or a new factor model such as the Fama-French model. It is my opinion that this is a debate the Commission should avoid. As Harvey, Liu and Zhu (2016) report, there are currently dozens of different versions of the factor

[5] I note that it is important to use the same long-term Treasury rate when applying the model as is used in estimating the equity risk premium.

[6] The Commission has traditionally used a six-month study period rather than "spot" (single-date) model inputs. While I would not recommend that approach as a matter of economic theory, I recognize that it is an established practice by the Commission, and legal-prudential rather than strictly economic considerations may support its continuation. The difference between a six-month and spot study period is secondary compared to the problems I discuss with using the proposed "Expected Earnings," a DCF model with an inappropriately high constant growth rate, or a CAPM with a mis-specified equity risk premium.

models.[7] Fama and French alone have proposed three different versions. Virtually none of these models are developed from first principles like the CAPM.

As evidenced by the AFP surveys discussed previously, the CAPM is still widely used in practice, in part because its inputs are readily available, and it is straightforward to apply. All that is required is a measure of the risk-free rate, the company's Beta, and an estimate of the equity market risk premium. There is widespread agreement that the best estimate to use for the risk-free rate is the yield on long-term Treasury bonds, which is the rate used by the Commission. I discuss the Beta and the equity risk premium below.

I note that there remains a debate regarding whether a size premium should be added to the output of the CAPM model. This debate has gone on for almost forty years since the publication of the original article by Rolf Banz in 1981 and remains unresolved today.[8] I think the current state of affairs is best summarized by Damodaran (2015). Regarding including a size adjustment in the CAPM, he states,

> I question the adjustment for three reasons:
>
> 1. On closer scrutiny, the historical data, which has been used as the basis for the argument, is yielding more ambiguous results and leading us to question the original judgment that there is a small cap premium.
>
> 2. The forward-looking risk premiums, where we look at the market pricing of stocks to get a measure of what investors are

[7] Harvey, Campbell, Yan Lui and Heging Zhu, 2016, *…and the Cross-Section of Expected Returns*, Review of Financial Studies 29 (1): 5-68 (available at https://faculty.fuqua.duke.edu/~charvey/Research/Published_Papers/P118_and_the_cross.PDF; ellipsis and capitalization in original title).

[8] Banz, Rolf, 1981, The relationship between return and market value of common stocks, *Journal of Financial Economics*, 9 (1) 3-18.

> demanding as expected returns are yielding no premiums for small cap stocks.
>
> 3. If the justification is intuitive, i.e. that smaller firms are riskier than larger firms, much of that additional risk is either diversifiable, better adjusted for in the expected cash flows (instead of the discount rate) or double counted.
>
> The small cap premium is a testimonial to the power of inertia in corporate finance and valuation, where once a practice becomes established, it becomes difficult to challenge, even if the original reasons for it have long since disappeared.[9]

Domodaran goes on to observe:

> After all, if the proponents of small cap premiums are right, bundling together small companies into a larger company should instantly generate a bonus, since you are replacing the much higher required returns of smaller companies with the lower expected return of a larger one. In fact, small companies should disappear from the market.[10]

Even if it is accepted that a small cap premium applies to typical industrial corporations, that does not mean it applies to utilities. The two standard "intuitive" rationalizations for a premium are that small firms are riskier and less liquid. However, in the case of utilities, risk is primarily a function of regulation which has nothing to do with firm size. In addition, utility investors tend to be long-run holders interested in dividends, not in-and-out traders. As a result, liquidity is not likely to be an important consideration.

At an empirical level, there is almost no research on whether a size premium exists for utility stocks. The one notable exception is Wong (1993) who reported that there was no small

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[9] Domodaran, Aswath, 2015, The small cap premium: Where is the beef?, *available at* http://aswathdamodaran.blogspot.com/2015/04/the-small-cap-premium-fact-fiction-and.html.

[10] *Id*.

cap premium for utilities.[11] Zepp (2003) revisited the issue, but his work was limited to a small sample of water utilities, and did not adjust for risk, so no meaningful conclusion can be drawn from his analysis.[12] Over all, neither theory nor evidence supports adding a size premium in the case of utilities.

Turning to the DCF model, it is an entirely different procedure for estimating the required return. This does not make it superior or inferior to the CAPM. It is simply a different approach to the problem of estimating required returns. For regulated utilities, I recommend the Commission use both approaches because by combining the two results the Commission can arrive at a more stable and reliable measure of the required return on equity.

As discussed previously, the academic literature does not endorse the Expected Earnings model as a procedure for estimating the cost of equity capital because it does give a meaningful estimate of the rate of return on equity required by investors.

E4. How are alternative models redundant or complementary with each other and/or the DCF model?

As I noted above, the different models offer different perspectives on the same problem. They are not redundant, but they are not completely complementary either. They are different ways of analyzing the same problem. That is why considering the results from both the CAPM and the DCF model is a wise approach.

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[11] Wong, Annie, 1993, Utility stocks and the size effect: An empirical analysis, *Journal of the Midwest Finance Association*, 95-101.

[12] Zepp, Thomas, M, 2003, Utility stocks and the size effect – revisited, *Quarterly Review of Economics and Finance*, 34: 578-582.

E5 & E6. To what extent do alternative models avoid any deficiencies of the DCF model and/or operate better in diverse capital market conditions? To the extent that investors use multiple models, should the Commission combine them in its analysis or use the "best" one that would apply in all market conditions?

Because the CAPM and the DCF model are different ways of analyzing the same problem, using both, with reliable inputs, can provide useful information. From a financial analysis perspective, my recommendation is that the Commission apply both. Going further and attempting to include unproven factor models would be an unnecessary distraction. Including an E/B model would be worse than an unnecessary distraction—doing so would only distort the useful information provided by valid market-based models.

E7. If the Commission were to consider multiple models, how should it weigh them?

There is no scientific way to weight them. Accordingly, I suggest simple averaging of the accepted market-based models. In determining through this proceeding which models are accepted and how they should be specified, a significant deviation between the results of the two models should provide an impetus for further analysis, especially whether the deviation is a function of the models themselves or the nature of the inputs used in each model. Again, the "Expected Earnings" model is not market-based and should not be given any weight.

E8. To what extent is it reasonable for the Commission to use a simplified version of a model that does not reflect all the variables that investors consider?

All models are simplifications. Adding more variables does not necessarily increase accuracy. Importantly, the Commission should use models tested and endorsed by the academic literature as well as investors. The Commission should not rely on untested, simplified models

potentially used by certain investors. If properly implemented, the CAPM and the DCF models require relatively few inputs and for established, stable firms these inputs are generally ascertainable within a reasonable range. Adding more variables can actually increase measurement error and is almost certain to lead to unnecessary controversy. The more important consideration is that the right inputs be used. In the case of the CAPM, this means appropriate choices for Beta and the equity market risk premium. In the case of the DCF model, this means appropriate treatment and weighting of the expected short-term and long-term dividend growth rates.

E11. To what extent, if any, should the Commission exercise judgment in using financial models to set ROEs under various capital market conditions?

As stated earlier, both the CAPM and the DCF model reflect capital market conditions and offer different perspectives on the same problem. Therefore, it is reasonable for the Commission to determine the ROE by using both models. However, without a new and better model, exercising judgment to adjust the ROEs determined by academically tested and endorsed models likely introduces additional measurement error and speculation.

Whatever method is used for reconciling the models, it should be applied consistently. For instance, if the Commission decides to average the results produced by the CAPM and the DCF model, it should do so on a consistent basis. Changing the weights applied to the two models is likely to lead to "cherry picking" and unreliable results.

F1. Does the mismatch between market-based ROE determinations and a book value rate base support current market values? Is this mismatch a problem?

Market-based ROEs, i.e., ROEs based on the DCF, CAPM, or factor models, provide

estimates of the expected return on equity. In other words, market-based ROEs are economic rates of return. Economic rates of return are not the same as accounting-based rates of return, and Fisher and McGowan (1983) demonstrate that accounting based rates of return do not provide meaningful estimates of economic rates of return.[13] Furthermore, as discussed by Alexander Robichek (1978), using accounting-based rates of return for regulated utilities to estimate ROEs introduces circularity whereas using accounting-based rates of return on unregulated firms to estimate utility ROEs results in lack of comparability and potential differences in accounting.[14] A more recent book, Lev and Gu (2016), stresses the difference between accounting returns and the economic returns that investors require and warns against using accounting data to estimate economic returns.[15] Because of these issues, in my opinion, accounting based rates of return should not be used to estimate the required return on equity capital.

Economic models, including the residual earnings valuation model discussed below, demonstrate that applying market-based ROE determinations to a book-value rate base should not introduce a significant mismatch problem if the book value rate base is a reasonable measure of the firm's invested capital. If the book value rate base is not a reasonable estimate of the firm's invested capital, the Commission should endeavor to adjust the rate base calculation to better reflect invested capital.

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[13] Fisher, Franklin M. and John H. McGowan, 1983, On the misuse of accounting rates of return to infer monopoly profits, American Economic Review, 73 (1): 82-97.

[14] Robichek, Alexander A., 1978, Regulation and Modern Finance Theory, *Journal of Finance*, 693 (3): 693-705.

[15] Lev, Baruch and Feng Gu, 2016, The End of Accounting and the Path Forward for Investors and Managers, Wiley, New York, NY.

Finally, the difference between current market values and book values of utilities' publicly traded parent stocks is likely not solely the result of a mismatch between market-based ROEs and a book value rate base. That difference may reflect differences between utility operating companies and their parents. It is also a result of regulators' past and anticipated future over-estimates of the cost of equity. As discussed below, if regulators use a DCF model (whether directly or as a component of a CAPM model) that incorporates an unrealistically high long-term growth rate, the resulting ROE estimate will overstate the firm's cost of equity capital.

F2. Why have most or all utility market-to-book ratios consistently exceeded one?

Lev and Gu (2016) explain that under standard accounting, there are quite substantial "intangible" aspects of modern enterprises (such as human resources, research & development, proprietary business processes, customer relationships, branding, and reputation) that contribute to earnings and market value but often do not appear in the balance sheet as assets and are therefore omitted from the balance sheet "equity book value."[16] As equity book value provides the divisor of both the M/B ratio and the E/B ratio, these intangible assets go a long way toward explaining both why M/B ratios often exceed one and why E/B ratios often exceed the cost of equity.

Another key relation for understanding M/B ratios is the residual earnings valuation model. As described in leading textbooks, such as Penman (2016) and Holthausen and Zmijewski (2019), the residual earnings valuation model states that the market value of the firm equals the book value plus the present value of all expected future residual earnings. Residual

[16] *See id*. at 81-91.

earnings are defined as (ROE – Cost of Equity) * Book Value. The model makes it clear that the market-to-book value exceeds 1.0 when investors expect ROE to consistently exceed the cost of equity for the firm.[17]

For regulated utilities, estimation error can cause the expected ROE to consistently exceed the cost of equity if the ROE estimation process is based on models with inappropriately defined inputs or inappropriate models. For example, as discussed above, the expected constant growth rate is a critical input in the Commission's DCF model. If the expected constant growth rate used in the DCF model is unrealistically high, the resulting ROE overstates the cost of equity capital required by investors.

As noted earlier, Fisher and McGowan (1983) show that, using accounting-based measures of return, e.g. the Expected Earnings model, to estimate economic measures of return can lead to significant errors in estimating the cost of equity capital. Therefore, including ROEs based on the Expected Earnings model in the Commission's ROE determination process will likely increase, not decrease, estimation errors.

Estimation error in the ROE set by the Commission can also arise from reliance on faulty proxy groups. For example, including companies with inappropriately high ROEs in a proxy group for a specific utility will likely result in estimation error. For many regulated utilities, the market-to-book ratio is not readily available because the regulated utility is a subsidiary of a

[17] It is possible for the market-to-book ratio to consistently exceed one if economic depreciation, the decrease in the economic value of the firm's capital stock is less than accounting depreciation. This can occur for several reasons, including inflation and the use of accelerated depreciation methods for accounting purposes. Under these circumstances, the market-to-book ratio can consistently exceed one even though the ROE is equal to the cost of equity capital.

publicly traded holding company, which frequently includes non-regulated operations.[18] In this scenario, if the market-to-book ratio consistently exceeds one, it is difficult to isolate whether the market expects the ROE for the combined firm to exceed the cost of equity for the combined firm due to regulated or non-regulated operations. It is possible that the ROE for the regulated subsidiary is equal to the cost of equity for that subsidiary while the non-regulated operations provide opportunities for the ROE to exceed the cost of capital for those operations. It is also possible for the market to expect the allowed ROE for the regulated operations to consistently exceed the utilities' actual cost of equity capital. This will occur if the ROE for the regulated operations is not determined in an unbiased fashion. For example, it will occur if the market expects the constant growth rate in the Commission's DCF model to be set unrealistically high, or expects companies with inappropriately high ROEs to be included in utilized proxy groups. Therefore, the Commission should determine realistic expected constant growth rates, and proxy groups for regulated utilities should properly reflect the risk of the regulated entity.

F4. Should the Commission revise our use of these models to account for the mismatch between market-based ROE determinations and book-value rate base? If so, how? For example, should the Commission adjust the dividend yield used in the DCF model to represent a yield on book value rather than a yield on stock price?

As discussed above and evidenced by the residual earnings valuation model, adjustments to

[18] Acquisition transactions involving regulated subsidiaries can provide some information regarding the market-to-book ratio of the regulated operations. However, relying on these transactions to form conclusions regarding the market-to-book ratio is problematic because typically publicly available information does not allocate the acquisition price between the stand-alone value of the acquired operations and potential synergies associated with the transaction.

unbiased market-based ROE estimates should not be required to equate market-based ROEs with a book value rate base if the book value rate base is a reasonable estimate of the firm's invested capital. The key is that the Commission make an effort to estimate the cost of equity as accurately as possible. As I stressed previously, relying on accounting-based measures to estimate economic rates of return is likely to result in measurement errors. Those errors can cause the market value and the book value of assets to diverge.

F5. Should the Commission consider adjusting ROEs to account for market-to-book ratios above or below one? Would doing so introduce circularity into Commission ROEs by setting the ROE at whatever level of earnings the market expected, rather than making an independent assessment of the appropriate ROE?

Finance theory suggests that, in order for utilities to attract capital, the Commission should set allowed ROEs at utilities' cost of equity, meaning the level necessary to enable investors to expect to earn their required rate of return on the capital they invest. Any adjustment away from that level to account for market-to-book ratios above or below one would be based on policy and law, not finance theory.

If the Commission adjusted ROEs in an attempt to cause market-to-book ratios to equal one, both the adjustments themselves and the expectation of the adjustments would introduce circularity. Under that scenario, the expectation that an adjustment would be made if the market-to-book ratio deviated from one would impact the observed market-to-book ratio. In my opinion, this practice should be avoided. Rather, the Commission should try to estimate the cost of equity as accurately as possible.

H2.a.1. Should the Commission continue to use a dividend DCF model or should the

Commission use a different DCF model, for example, one based on free cash flow?

The dividend DCF model used by the Commission to estimate the required return on equity is derived from the dividend discounted cash flow model. On a per share basis, the dividend discounted cash flow model is generally expressed as

$$P_0 = \frac{DIV_1}{(1+r_E)^1} + \frac{DIV_2}{(1+r_E)^2} + \frac{DIV_3}{(1+r_E)^3} + \cdots + \frac{DIV_\infty}{(1+r_E)^\infty} \quad (1)$$

In equation (1), P_0 equals the value of a share of the firm's common equity today, DIV_t equals the expected dividend paid per share to common equity (and share repurchases per share of common equity) at time t, and r_E equals the cost of common equity capital.

Assuming constant growth, equation (1) becomes

$$P_0 = \frac{DIV_1}{(r_E - g)} \quad (2)$$

In equation (2), P_0 continues to equal the value of a share of the firm's common equity today, DIV_1 equals the expected dividend payment per share to common equity (and share repurchases per share of common equity) for the next year, r_E continues to equal the cost of common equity capital, and g equals the expected constant growth rate for dividend payments to common equity (and share repurchases of common equity). Rearranging equation (2) results in the general formula for the constant growth DCF model

$$r_E = g + \frac{DIV_1}{P_0} \quad (3)$$

Notably, g, the expected rate of constant growth in equations (2) and (3) represents constant growth <u>in perpetuity</u>.

As explained by Holthausen and Zmijewski, "[t]he dividend discounted cash flow valuation method…is similar to the Equity DCF valuation method. In fact, if expected dividend

distributions equal expected equity free cash flows, the two methods are identical."[19] This result is apparent when the general formula for the dividend discounted cash flow model is compared to the general formula for equity discounted cash flow model, which is

$$V_E = \frac{EFCF_1}{(1+r_E)^1} + \frac{EFCF_2}{(1+r_E)^2} + \frac{EFCF_3}{(1+r_E)^3} + \cdots + \frac{EFCF_\infty}{(1+r_E)^\infty} \qquad (4)$$

In equation (4), V_E equals the value of the firm's common equity, $EFCF_t$ equals the expected free cash flow to common equity at time t, and r_E equals the cost of common equity capital. Although equation (4) is stated in terms of the firm's total common equity, it can be converted to a per share formula by converting EFCF to a per share value.

A comparison of equation (1) and the per-share version of equation (4) reveals their conditional equivalence: The two formulas are identical if the timing and amount of the expected dividend distributions (and share repurchases) represented by the DIV values in equation (1) are equal to the expected free cash flows per share to common equity represented by those equation (4) per-share EFCF values. Moreover, if the timing of dividend payments (and share repurchases) does not match the timing of free cash flows per share to common equity, but the inputs are estimated consistently, the valuations derived based on equation (1) or equation (4) converted to a per share equivalent will be the same.

Therefore, as between the dividend discounted cash flow model and the equity discounted cash flow model, the preferred model is dependent on the ability to estimate dividends versus free cash flows to equity. Between the two, for regulated utilities, free cash flows to equity are likely more difficult to estimate, because (a) estimates of future capital

[19] Holthausen and Zmijewski (2019), page 225.

expenditures and non-recurring items increases the variability of expected free cash flows to equity more than the variability of expected dividends, and (b) electric utility parent companies generally make limited or no use of stock repurchases.

H2.a.2. Could terminal stock value be used in place of long-term growth projections? If so, how should terminal stock value be determined?

Many valuation textbooks discuss the calculation of a firm's terminal common stock value. That calculation typically relies on the basic constant-growth valuation equation

$$P_t = \frac{DIV_{t+1}}{(r_E - g)} \qquad (5)$$

where P_t equals the terminal (or continuing) value of a share of the firm's common equity at time t, DIV_{t+1} equals the expected dividend payments per share to (and share repurchases per share of) common equity at time t+1, r_E equals the firm's cost of common equity capital, and g equals the expected constant growth rate of the firm's expected dividend payments to (and share repurchases of) common equity at time t.

Notably, a key input in equation (5) and the terminal value of a firm's common equity is the expected constant growth rate, which incorporates the expected long-term growth rate. Therefore, deriving a terminal value of a firm's common equity requires a determination of the expected long-term growth rate. Using the terminal value to estimate the expected long-term growth rate would introduce circularity into the model.

Furthermore, the terminal value of a firm's common equity reflects the expected long-term growth rate regardless of the model used to estimate the terminal value. For example, if a net income multiple is used to derive the terminal value of the firm's common equity, that multiple should reflect the expected long-term growth rate at the time the terminal value is

estimated, time t. The expected long-term growth rate at time t may differ from current growth expectations. In this scenario, the unadjusted net income multiple based on current expectations should not be used to estimate the terminal value. Rather, the multiple should be adjusted to properly reflect the long-term growth rate at time t. Again, the process of making this adjustment would introduce circularity because the adjustment would reflect, among other things, any difference between current expected growth rates and the expected long-term growth rate at time t.

H.2.a.3. Do investment analysts project earnings/dividends growth beyond five years, and if not, why not, and is GDP an appropriate proxy for long-term growth?

Typically, investment analysts do not project earnings/dividend growth beyond five years because longer term growth projections become increasingly speculative. However, economic reasoning puts an upper limit on long-term dividend growth. Over the long run, dividends have remained an approximately constant fraction of GDP. This means that the long-run growth rate of dividends must be the same as GDP. Clearly, dividend growth cannot exceed GDP growth or dividends would eventually become bigger than the entire economy. This means that GDP growth is an upper limit for long-term dividend growth.

While dividend growth cannot exceed GDP growth in the long run, it can fall short for individual companies. As Bernstein and Arnott (2003) and Cornell (2010) point out, part of aggregate dividend growth is accounted for by new enterprises.[20] As a result, the growth rate in

[20] Bernstein, William J. and Robert D. Arnott, 2003, Earnings growth: The Two Percent Dilution, *Financial Analysts Journal*, 59 (5): 47-55. Cornell, Bradford, 2010, Economic growth and equity investing, *Financial Analysts Journal*, 66 (1): 54-64.

dividends for existing enterprises may fall short of aggregate GDP growth. Consequently, the Commission should use a long-run dividend growth rate that does not exceed the expected long-run nominal growth of GDP. Forecasts for long-run GDP growth are prepared by various private forecasters and government agencies.

H.2.a.4. How should the Commission weight short-term and long-term earnings/dividend growth projections?

The formulas set forth in equations (2), (3), and (5) above work properly only if *g*, the expected constant growth rate, for each equation is truly constant. If it is not constant, the Commission should not "weight" short-term and long-term growth projections to arrive at an expected constant growth rate. Rather, the Commission should model short-term and long-term projections to account for differences and the durations of the expected growth rates.

One modeling method would be to create detailed annual forecasts of expected dividend payments (and share repurchases) or expected free cash flows to common equity and use a spreadsheet based on equations (1) or (4) respectively to solve for the cost of common equity capital. This method requires long-term forecasts because firms are typically assumed to have an indefinite life.

Alternatively, a multi-stage model based on equation (6) below can be used.

$$P_0 = \sum_{t=1}^{C} \frac{DIV_t}{(1+r_E)^t} + \frac{DIV_{c+1}}{(r_E - g)} * \frac{1}{(1+r_E)^C} \qquad (6)$$

In equation (6), P_0 equals the value of a share of the firm's common equity today, DIV_t equals the expected dividend paid per share to common equity (and share repurchases per share of common equity) at time t, r_E equals the cost of common equity capital, and g equals the expected constant growth rate at time C. If equation (6) is used, detailed forecasts are created until year C,

the year the firm is expected to reach stable state and is expected to grow at a constant rate, g, thereafter. Using a spreadsheet, the detailed forecast, and P_0 one can solve for r_E.

If an equation similar to equation (3), which assumes a single constant growth rate, is used to estimate the cost of common equity capital, and the expected growth rate for the firm is not truly constant, an effective constant growth rate must be calculated. To arrive at a reasonable estimate, the short-term and long-term growth must be modeled explicitly, and a spreadsheet used to solve for the constant growth rate implied by the combination of the expected short-term and long-term growth rates. This exercise should include explicit growth projections for each year until it is reasonable to assume that the firm has reached a stable long-term growth rate which are used to calculate annual expected payouts to equity. From the projection of expected equity payouts and the beginning indexed value, one can solve for the internal rate of return ("IRR"), which is the effective discount rate. The implied constant growth rate is equal to the IRR minus the equity payout yield in year 1.

Table 1 below provides an example of this approach. In Table 1, I have created a 500-year projection. I assumed an expected growth rate for the next five years of 10%. Thereafter, I have assumed a constant long-term growth rate of 3.8%. The year 1 equity payout yield, equal to the expected dividend (and share repurchase) yield, is assumed to be 3%. From this yield and the expected future growth rates, equity payouts are calculated for each year based on a beginning index value of 100. From these payouts and the beginning index value, the IRR is determined to be 7.5163%, implying a constant long-term growth rate of 4.5163% (7.5163% - 3.0%).

TABLE 1

Expected Long-Term Growth Rate:		3.80%
Indexed Equity Value at Year 0:	[1] = P_0	100.0
Equity Payout Yield at Year 1:	[2] = D_1/P_0	3.00%
Internal Rate of Return (IRR) at Expected Growth Rates:	[3]	7.5163%
Implied Contstant Long-Term Growth:	[4] = [3] - [2]	**4.5163%**

Data for Calculation of IRR

Year	Expected Growth Rate	Indexed Equity Payout at Expected Growth Rates
1	10.00%	3.0
2	10.00%	3.3
3	10.00%	3.6
4	10.00%	4.0
5	10.00%	4.4
6	3.80%	4.6
7	3.80%	4.7
8	3.80%	4.9
9	3.80%	5.1
10	3.80%	5.3
|	|	|
500	3.80%	457,490,398.7

Check of Implied Constant Growth Rate

Year	Indexed Equity Payout at Implied Constant Growth Rate	Net Present Value @ 7.5163%
1	3.0	2.8
2	3.1	2.7
3	3.3	2.6
4	3.4	2.6
5	3.6	2.5
6	3.7	2.4
7	3.9	2.4
8	4.1	2.3
9	4.3	2.2
10	4.5	2.2
|	|	|
500	11,220,885,265.3	0.0
	Total NPV	**100.0**

Table 1 also includes a check on this calculation. Using the implied constant growth rate, I have calculated implied equity payouts for the same time period as my original projection. The net present value of these payouts, discounted at the IRR, should be and is equal to the beginning index value.

The implied ROE based on a constant growth rate of 4.5163% is substantially less than an estimated ROE based on a weighting methodology using 2/3 times the short-term expected

growth rate and 1/3 times the long-term expected growth rate. If one had applied a 2/3 weight to the expected short-term growth rate of 10.0%, and a 1/3 weight to the expected long-term growth rate of 3.8%, the result would be 7.9333%. This estimate is more than 1.75 times greater than the implied constant growth rate calculated in Table 1. As stated previously, overstating the long-term growth rate results in the DCF model overstating the ROE. In this example, the appropriate ROE is 7.5163%, whereas the weighting approach would result in an estimated ROE of 10.9333%.

Modeling expected growth rates in this manner reveals the relationship between expected short-term growth rates, expected long-term growth rates, and the implied constant growth rate. Notably, the implied constant growth rate will be close to the expected long-term growth rate unless there is substantial growth for an extended period of time prior to reaching the start date for the expected long-term growth assumption. Again, the constant growth rate for a single stage DCF model is expected to continue in perpetuity.

If expected growth rates are not modeled properly and short-term growth rates, which are typically higher than long-term growth rates, are weighted too heavily, the likely outcome is an overstatement of both the expected constant growth rate and the required ROE. The amount of the overstatement will increase as the difference between the expected short-term growth rate(s) and expected long-term growth rate rises.

H.2.a.5. The Commission uses a constant growth DCF model. Should the Commission consider using a multi-stage DCF model? If so, how would the Commission determine the length of each stage of a proxy company's growth?

A multi-stage DCF model using detailed annual forecasts as described above would be preferable to a single-stage DCF model. As shown in Table 1, however, a single, implied constant growth rate can be determined once the annual expected growth rates are known.

A multi-stage model likely provides a more robust estimate of the ROE, because it explicitly addresses the timing of differences between short-term and long-term growth rates. It is true that if a multi-stage model is used, multiple growth rates are required, and the length of each growth rate must be specified. Typically, analyst projections provide details regarding the timing and length of their estimates. If analyst estimates are used to derive expected short-term growth rates, a multi-stage model should use the analyst projections for the duration of those projections. For utilities with expected short-term growth rates similar to the expected long-term growth rate, it may be reasonable to use a two-stage model where the first stage reflects analyst growth rates and the second stage reflects the expected long-term growth rate. However, for utilities with expected short-term growth rates which are substantially above the expected long-term growth rate, it would be preferable to allow for a transition between short-term growth and long-term growth. In valuation models, typically, these transition periods are 5 or 10 years. In my view, this is a reasonable procedure. I have used it to model growth rates on numerous occasions, including testimony for appraisal matters in Delaware.

It is also possible to create an implied constant growth rate using this convergence approach. Table 2 below applies the convergence approach using the assumptions underlying

Table 1. Table 2 shows that the implied constant growth rate is 4.9738%.

TABLE 2

Expected Long-Term Growth Rate:		3.80%
Indexed Equity Value at Year 0:	[1] = P_0	100.0
Equity Payout Yield at Year 1:	[2] = D_1/P_0	3.00%
Internal Rate of Return (IRR) at Expected Growth Rates:	[3]	7.9738%
Implied Contstant Long-Term Growth:	[4] = [3] - [2]	**4.9738%**

Data for Calculation of IRR

Year	Expected Growth Rate	Indexed Equity Payout at Assumed Growth Rates
1	10.00%	3.0
2	10.00%	3.3
3	10.00%	3.6
4	10.00%	4.0
5	10.00%	4.4
6	8.97%	4.8
7	7.93%	5.2
8	6.90%	5.5
9	5.87%	5.8
10	4.83%	6.1
11	3.80%	6.4
12	3.80%	6.6
13	3.80%	6.9
14	3.80%	7.1
15	3.80%	7.4
|	|	|
500	3.80%	529,762,010.1

Check of Implied Constant Growth Rate

Year	Indexed Equity Payout at Implied Constant Growth Rate	Net Present Value @ 7.9738%
1	3.0	2.8
2	3.1	2.7
3	3.3	2.6
4	3.5	2.6
5	3.6	2.5
6	3.8	2.4
7	4.0	2.3
8	4.2	2.3
9	4.4	2.2
10	4.6	2.2
11	4.9	2.1
12	5.1	2.0
13	5.4	2.0
14	5.6	1.9
15	5.9	1.9
|	|	|
500	99,216,987,160.5	0.0
	Total NPV	**100.0**

In summary, it is critical that the expected constant growth rate in a DCF model reflect growth in perpetuity. To accomplish this goal, either models with detailed annual forecasts should be developed and the ROE determined from those forecasts or, if a single-stage DCF

model is used based on a combination of short-term and long-term growth rates, the constant growth rate should be estimated in a manner similar to those shown in Tables 1 and 2.

H.2.b.1. If the market risk premium is determined by applying the DCF methodology to a representative market index, should a long-term growth rate be used, as in the Commission's two-step DCF methodology?

The solution is to use a proper two-stage model and solve for the discount rate. Damodaran (2018) provides an excellent example.[21] In his extensive paper on the implied equity risk premium, Damodaran states, "After year 5, we will assume that earnings on the index grow at 3.84%, the same rate as the entire economy."[22] His application in this context is consistent with what I recommended above when applying the DCF model to individual companies. Applying it to the market as a whole is just a special case.

H.2.b.2. Beta is a measure of a security's risk relative to the broader market, such as the S&P 500, not of its absolute risk. Do CAPM's assumptions break down if *both* utility stocks and the broader market become riskier over time on an absolute basis, but the relative increase in risk in utility stocks rises more slowly?

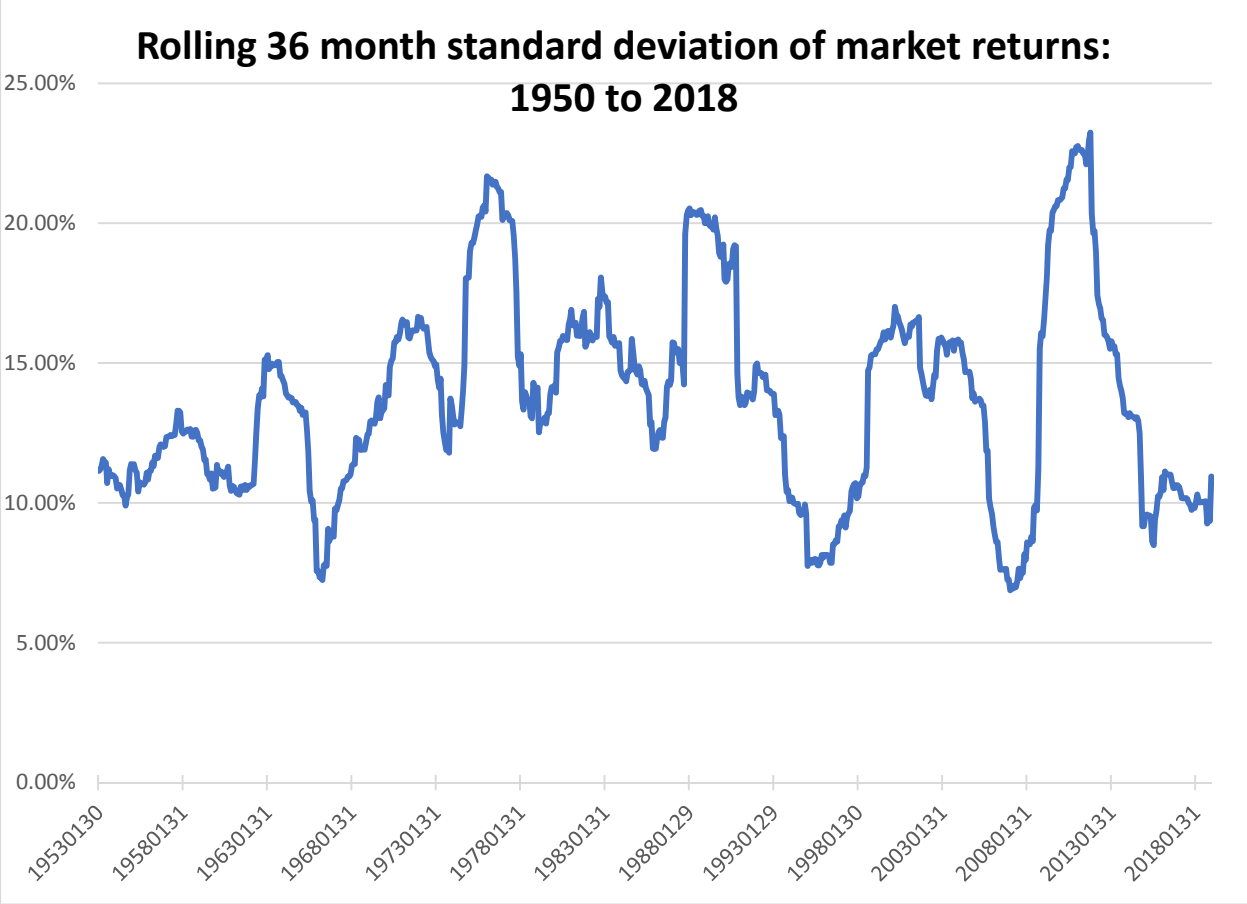
Both the CAPM and the DCF model work fine if the volatility of the market changes as long as the proper inputs are used. This is because the models incorporate such changes. For example, if an increase in the market volatility leads investors to require higher returns, then market prices will fall. This will cause both models to produce higher results for the required

[21] Damodaran, Aswath, 2018, Equity risk premiums: Determinants, estimation and implications – The 2018 edition, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3140837.

[22] *Id*. at 79.

return. In the case of the DCF model, for example, the lower market prices, holding dividend growth rates constant, will mean that the model produces a higher discount rate, i.e. a higher indicated cost of equity, to connect current lower market prices to the expected stream of growing dividends. For the same reason, the implied equity risk premium used in the CAPM will rise. There is no need to adjust either model as long as the appropriate inputs are used.

I do note, however, that evidence suggest that to the extent market risk has changed, it has declined. The figure below plots the rolling 36-month standard deviation of aggregate stock market returns. It shows ups and downs associated with recessions, booms and financial crises, but there is no trend. Currently, market volatility has been near record lows.



H.2.b.3. What are appropriate data sources for the beta value?

Several reputable sources publish estimates of beta, including, Bloomberg and Valueline. The AFP 2013 Survey mentioned previously also reported on the sources investors used for beta. The majority of respondents, 59% and 65% in 2010 and 2013 respectively used Bloomberg as the source for beta.[23] In comparison, 10% of respondents in 2010 and 9% in 2013 reported using Ibbotson as the source for beta and 5% in 2010 and 4% in 2013 reported using Valueline's beta.[24]

Each supplier typically specifies the manner in which it calculates beta; however, certain suppliers, e.g. BARRA, have proprietary models which cannot be easily replicated. Because differences between calculation methodologies exist, for estimating utility ROEs, a source or sources of beta should be determined and used consistently. Furthermore, it is not advisable to adjust the beta calculated by a reputable supplier. Such adjustments are likely to increase, not decrease, measurement error.

H.2.b.4. Should the Commission employ more sophisticated versions of the CAPM model that consider more variables instead of only beta, such as the Fama-French Model?

As noted earlier, attempting to use more complex, but as yet unproven, models is not advisable. The CAPM and the DCF model are established approaches that have been in widespread use for more than half a century. In distinction there are dozens of factor models in

[23] AFP 2013 Survey, page 7.

[24] I note that Ibbotson was acquired by Morningstar and is no longer an independent source.

addition to the Fama-French. In fact, there are three versions of the Fama-French model using different numbers of factors.[25] Virtually none of these factor models have been developed from theoretical first principles, and all of them remain highly controversial. In addition, many of the factor models are cumbersome to implement and require complex and still unproven statistical techniques. I recommend that the Commission rely on the DCF model and on the basic version of the CAPM model unless and until the academic literature concludes that another model is clearly superior.

H.2.c.1. & H.2.c.2. Should the use of utilities in the proxy group for the Expected Earnings model be predicated on the Expected Earnings analysis being forward-looking? What, if any, concerns regarding circularity are there with using the Expected Earnings analysis to determine the base ROE, as opposed to using the analysis for corroborative purposes?

As noted earlier, the academic literature does not endorse the Expected Earnings model as a procedure for estimating the cost of equity capital because it is based on accounting measures and does not provide a reliable estimate of the rate of return on equity required by investors. None of the leading textbooks recommends using an accounting-based Expected Earnings model to estimate the equity return required by investors.

If an Expected Earnings model is used, selection of a proper proxy group raises additional concerns. For the sake of comparability, a proxy group for use in an Expected

[25] The three Fama-French models are presented in the following papers. Fama, Eugene F. and Kenneth R. French, The cross section of expected returns, *Journal of Finance*, (47): 427-465. Fama, Eugene F. and Kenneth R. French, 2012, Size, value and momentum in international stock return, *Journal of Financial Economics*, 105: 457-472. Fama, Eugene F. and Kenneth R. French, 2015, A five factor asset pricing model, *Journal of Financial Economics*, 117: 470-488.

Earnings model should focus on stocks in the regulated utility sector that have M/B and E/B ratios similar to those of operating utility companies. This comparability requirement applies whether the utilized E/B ratio is based on historical E/B, expected E/B, or both. Either way, it is likely that regulated utilities will be heavily represented in a proxy group of companies comparable to a regulated utility. On the other hand, if such a proxy group is selected and the ROE for companies in the group is determined based on the Expected Earnings model, this approach introduces circularity. Furthermore, circularity is introduced whether the model is based on historical results or forward-looking results, because both set of results are impacted by rates set based on the ROE. If historical data is used, the historical results were based on the ROE(s) previously determined by regulators. If forward-looking expected results are used, the expected results incorporate expectations regarding future ROE(s) determined by regulators.[26] Thus, an "Expected Earnings" model cannot be risk-comparable unless it is circular, and cannot avoid circularity without neglecting comparability.

[26] Expected regulatory actions also affect the inputs to the DCF approach, but in partly offsetting ways: expectations of earnings-increasing regulatory action increase both forecast earnings (increasing the growth input) and current market prices (decreasing the dividend yield). In contrast, the "Expected Earnings" method is based solely on accounting measures and fails to take account of the change in market prices in the denominator.

I declare under penalty of perjury that the contents of the foregoing Statement are true and correct to the best of my knowledge, information and belief.

BRADFORD CORNELL, PH.D.

Executed in La Canada, California on June 25, 2019.

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TEACHING

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Applied Corporate Finance and Investing

The Law and Finance of Corporate Acquisitions

Corporate Finance

Investments

Options, Futures and Other Derivatives

PUBLICATIONS

Books and book chapters

- *Conceptual Foundations of Investing*, With Andrew Cornell and Shaun Cornell, John Wiley and Sons, New York, NY, 2018.
- "Stock Repurchases: Tradeoffs and Trends," *Dividends and Dividend Policy*, H. Kent Baker, ed., Blackwell Publishing, New York, 2009.
- "Securities Fraud Damages," With J. Hirshleifer and J. Haut. *Developments in Litigation Economics*, Vol. 87, P. Gaughan and R. Thornton, eds., Elsevier, Ltd., Oxford, UK, 2005.
- *The Equity Risk Premium and the Long-Run Future of the Stock Market*. John Wiley and Sons, New York, NY, 1999.
- "Corporate Valuation," *Handbook of Modern Finance*, 3rd edition, Dennis Logue, ed., Warren Gorham Lamont, Boston, MA, 1994.
- *Corporate Valuation: Tools for Effective Appraisal and Decision Making*. McGraw-Hill, New York, NY, 1993.

Academic articles

- "How Efficient is Sufficient?" With John Haut, *The Business Lawyer*, 2019, Vol. 74, 2, pp. 417–434.
- "Can Private Equity Firms Pay Fair Value for Acquisitions?" With Richard Gerger, *Journal of Private Equity,* 2018, Vol. 21, 4, pp. 69–74.
- "What is the Alternative to the Efficient Market Hypothesis?" *Journal of Portfolio Management*, 2018, Vol. 44, 7, pp. 3–6.
- "Yes, It's a Bubble. So What?" With Rob Arnott and Shane Sheppard, *Research Affiliates Publication on Fundamental Investing*, April 2018.
- "Do Valuation Multiples Reflect a Size Effect," With Rajiv Gokhale, *Journal of Business Valuation and Economic Loss Analysis*, 2018, Vol. 13, 1, pp. 2–14.

- "Estimating the Terminal Value with Inflation: The Inputs Matter – It is not a Formulaic Exercise," With Richard Gerger, *Business Valuation Review*, 2017, Vol. 36, 4, pp. 117–123.
- "A Note on Estimating Constant Growth Terminal Values with Inflation," With Richard Gerger, *Business Valuation Review*, 2017, Vol. 36, 3, pp. 102–105.
- "Passive Investing and Market Efficiency**,"** *Journal of Investing*, 2017, Vol. 26, 3, pp. 7–9.
- "Does Past Performance Matter in Investment Manager Selection," With Jason Hsu and David Nanigian, *Journal of Portfolio Management*, 2017, Vol. 43, 3, 33–43. Winner Bernstein/Fabozzi Award for 2017. Commentary in 20th Anniversary Volume of Bernstein/Fabozzi winners.
- "Information Flow and Expected Inflation: An Empirical Analysis," *Journal of Investing*, 2017, Vol. 26, 4, pp. 8–15.
- "Accounting Information, Investor Sentiment and Market Pricing," With Wayne R. Landsman and Steven R. Stubben, *Journal of Law, Finance and Accounting*, 2017, Vol. 2, 2, pp. 325–345.
- "Presidential Politics and Stock Returns," With Rob Arnott and Vitali Kalesnik, *Research Affiliates Publication on Fundamental Investing*, June 2017.
- "An 'Enhanced' Corporate Valuation Model: Theory and Empirical Tests," With Rajiv Gokhale, *Business Valuation Review*, 2016, Vol. 35, 2, pp. 52–61.
- "The Tesla Run-up: Follow-up with Investment Implications," *Journal of Portfolio Management*, Fall 2016, Vol. 43, 1, pp. 1–4.
- "The Self-Fulfilling Prophecy of Popular Asset Pricing Models," With Jason Hsu, *Journal of Investment Management*, 2016, Vol. 14, 1, pp. 65–74.
- "Information and the Oil Price Collapse," *Journal of Portfolio Management Invited Article*, 2015, Vol. 42, 1, pp. 1–4.
- "Capital Budgeting: A General Equilibrium Analysis," *Journal of Financial Perspectives*, 2015, Vol. 3, 1, pp. 1–8.
- "Using Dividend Discount Models to Estimate Expected Returns, *Journal of Investing*, 2015, Vol. 23, 1, pp. 18–22.
- "How Efficient is Sufficient: Securities Litigation Post-*Halliburton*," *Bank and Corporate Governance Law Reporter*, 2014, Vol. 53, No. 4, pp. 26–33; December 2014 *Securities Fraud Litigation Reporter*, Vol. 38, No. 3, p. 327: 38 SRALR 327; January 2015 *RICO and Securities Fraud Law Reporter*, Vol. 61, No. 1, p. 13: 61 RSFLR 13.
- "Competition in Portfolio Management: Theory and Experiment," With Elena Asparouhova, Peter Bossaerts, Jernej Copic, Jaksa Cvitanic and Deborah. Meloso, *Management Science*, 2014, Vol. 61, 8, pp. 1868–1888.
- "Tesla: The Anatomy of a Run-up," With Aswath Damodaran, *Journal of Portfolio Management*, 2014, Vol. 41, 1, pp. 139–151. Winner Bernstein/Fabozzi Award for 2015. Commentary in 20th Anniversary Volume of Bernstein/Fabozzi winners.
- "Guideline Public Company Valuation and Control Premiums: An Economic Analysis," *Journal of Business Valuation and Economic Loss Analysis*, 2013, Vol. 8, 1, pp. 53–70.

- "Dividend Price Ratios and Stock Returns: International Evidence," *Journal of Portfolio Management*, 2013, Vol. 40, 2, pp. 122–127.
- "What Moves Stock Prices: Another Look," *The Journal of Portfolio Management*, 2013, Vol. 39, 3, pp. 32–38.
- "Discounted Cash Flow and Residual Earnings Valuation: A Comparison in the Context of Valuation Disputes, *Business Valuation Review*, 2013, Vol. 31, 4, pp. 10–20.
- "Dividend-Price Ratios and Stock Returns: Another Look at the History," *Journal of Investing*, 2013, Vol. 22, 2, pp. 15–22.
- "Demographics, GDP and Future Stock Returns: The Implications of Some Basic Principles," *The Journal of Portfolio Management*, 2012, Vol. 38, 2, pp. 96–99.
- "Market Efficiency and Securities Litigation: Implications of the Appellate Decision in Thane," *Virginia Law and Business Review*, 2011, Vol. 6, 2, pp. 237–255.
- "Investment Strategies and Investment Track Records," invited editorial, *The Journal of Portfolio Management*, 2011, Vol. 37, 4, pp. 3–5.
- "The Intriguing Case of KMP and KMR," *The Journal of Portfolio Management*, 2011, Vol. 37, 3, pp. 121–127.
- "Warren Buffett, Black-Scholes, and the Valuation of Long-Dated Options," *The Journal of Portfolio Management*, Summer 2010, Vol. 36, 4, pp. 107–111.
- "Economic Growth and Equity Investing," *Financial Analysts Journal*, January/February, 2010, Vol. 66, 1, pp. 54–64. Winner Graham and Dodd G&D Scroll Award for 2010.
- "Beliefs Regarding Fundamental Value and Optimal Investing," With J. Cvitanic and L. Goukasian, *Annals of Finance*, January 2010, Vol. 6, 1, pp. 83–105.
- "Collateral Damages and Securities Litigation," With J. Rutten. *Utah Law Review,* Vol. 2009, 3, pp. 717–748.
- "The Fundamental Nature of Recessions: A Contracting and Restructuring Approach," *The Economists Voice*, October 2009, pp. 1–4.
- "The Pricing of Volatility and Skewness," *Journal of Investing*, Vol. 18, Fall 2009, pp. 27–31.
- "Implications of the Financial Crisis for Financial Education," *Journal of Financial Education*, Vol. 35, Spring, pp. 1–6.
- "Investment Research: How Much Is Enough?," *Management Online Review*, Oxford Management Publishing, 2009, http://www.morexpertise.com/download.php?id=135.
- "Luck, Skill, and Investment Performance," *The Journal of Portfolio Management*, Vol. 35, Winter 2009, pp. 85–89. Winner Bernstein/Fabozzi Award for 2009.
- "The Basic Speed Law for Capital Market Returns," *CFA Magazine*, November/December 2008, pp. 10–11. Also published electronically by *Real Capital Markets*, October 24, 2008, http://www.realclearmarkets.com/articles/2008/10/the_basic_speed_law_for_capita_1.html.

- "The Impact of Analysts' Forecast Errors and Forecast Revisions on Stock Prices," With W. Beaver, W. Landsman, and S. Stubben. *Journal of Business Finance and Accounting*, Vol. 35, No. 5/6, 2008, pp. 709–740.
- "Market Efficiency, Crashes, and Securities Litigation," With J. Rutten. *Tulane Law Review*, Vol. 81, No. 2, 2006.
- "Accounting and Valuation: How Helpful Are Recent Accounting Rule Changes?," With W. Landsman, *Journal of Applied Corporate Finance*, Fall 2006, Vol. 18, No. 4.
- "Dividends, Stock Repurchases, and Valuation," *Journal of Applied Finance*, Vol. 15, No. 2, 2005, pp. 13–24.
- "How Do Analysts' Recommendations Respond to Major News?," With J. Conrad, W. Landsman, and B. Roundtree. *Journal of Financial and Quantitative Analysis*, Vol. 41, No. 1, 2006, pp. 39–68.
- "A Delegated Agent Asset Pricing Model," With R. Roll. *Financial Analysts Journal*, Vol. 61, No. 1, 2005, pp. 57–69. Winner Graham and Dodd G&D Scroll Award for 2006.
- "Co-movement as an Investment Tool," *The Journal of Portfolio Management*, Vol. 30, Spring 2004, pp. 1–5.
- "Compensation and Recruiting: Private Universities vs. Private Corporations," *Journal of Corporate Finance*, Vol. 10, No. 1, 2004, pp. 37–52.
- "Accounting and Valuation: Is the Quality of Earnings an Issue?," With W. Landsman. *Financial Analysts Journal*, Vol. 59, No. 6, 2003, pp. 20–28.
- "The Information that Boards Really Need," *Sloan Management Review*, Vol. 44, Spring 2003, pp. 71–76.
- "When is Bad News Really Bad News?," With J. Conrad and W. Landsman. *The Journal of Finance,* Vol. 57, December 2002, pp. 2507–2532.
- "The Parent Company Puzzle: When is the Whole Worth Less than the Sum of the Parts?," With Q. Liu. *Journal of Corporate Finance*, Vol. 4, December 2001, pp. 341–366.
- "Is the Response of Analysts to Information Consistent with Fundamental Valuation? The Case of Intel," *Financial Management*, Vol. 30, Spring 2001, pp. 113–136.
- "Equity Duration, Growth Options, and Asset Pricing," *The Journal of Portfolio Management*, Fall 2000, pp. 171–180.
- "Risk, Duration, and Capital Budgeting: New Evidence on Some Old Questions," *Journal of Business,* Vol. 2, April 1999, pp. 183–200.
- "The Term Structure, the CAPM, and the Market Risk Premium: An Interesting Puzzle," *Journal of Fixed Income,* Vol. 4, December 1998, pp. 85–89.
- "Cash Settlement when the Underlying Securities are Thinly Traded: A Case Study," *Journal of Futures Markets*, Vol. 17, No. 8, 1997, pp. 855–871.
- "Estimating the Cost of Equity Capital," With J. Hirshleifer and E. James. *Contemporary Finance Digest*, Vol. 1, Fall 1997, pp. 5–26.

- "The Valuation of Complex Derivatives by Major Investment Firms: Empirical Evidence," With A. Bernardo. *The Journal of Finance*, Vol. 52, June 1996, pp. 785–798.
- "Culture, Information, and Screening Discrimination," With I. Welch. *Journal of Political Economy*, Vol. 104, June 1996, pp. 542–571.
- "Throwing Good Money after Bad? Cash Infusions and Distressed Real Estate," With F. Longstaff and E. Schwartz. *Journal of the American Real Estate and Urban Economics Association*, Vol. 24, 1996, pp. 23–41.
- "An Hypothesis Regarding the Origins of Ethnic Discrimination," *Rationality and Society*, Vol. 7, January 1995, pp. 4–29.
- "Change Reinforces Use of DCF Method," *Natural Gas,* Vol. 11, October 1994, pp. 5–15.
- "Adverse Selection, Squeezes, and the Bid-Ask Spread on Treasury Securities," *Journal of Fixed Income*, Vol. 3, June 1993, pp. 39–47.
- "The Reaction of Investors and Stock Prices to Insider Trading," With E. Sirri. *The Journal of Finance, Vol.* 47, July 1992, pp. 1031–1059.
- "Liquidity and the Pricing of Low-grade Bonds," *Financial Analysts Journal*, Vol. 48, January/February 1992, pp. 63–68.
- "Measuring the Investment Performance of Low-grade Bond Funds," With K. Green. *The Journal of Finance*, Vol. 66, March 1991, pp. 29–48.
- "Using Finance Theory to Measure Damages in Fraud on the Market Cases," With G. Morgan. *UCLA Law Review*, Vol. 37, No. 2, 1990, pp. 883–924.
- "The Incentive to Sue: An Option Pricing Approach," *Journal of Legal Studies*, Vol. 17, No. 1, 1990, pp. 173–188.
- "Volume and R^2," *Journal of Financial Research*, Vol. 13, No. 13, 1990, pp. 1–7.
- "Measuring the Term Premium: An Empirical Note," *Journal of Economics and Business*, Vol. 42, No. 1, 1990, pp. 89–93.
- "Cross Sectional Regularities in the Reaction of Stock Prices to Bond Rating Changes," With W. Landsman and A. Shapiro. *Journal of Accounting, Auditing, and Finance*, Vol. 4, No. 4, 1989, pp. 460–479.
- "The Mispricing of US Treasury Bonds: A Case Study," With A. Shapiro. *The Review of Financial Studies*, Vol. 2, No. 3, 1989, pp. 297–310.
- "The Impact of Data Errors on Measurement of the Foreign Exchange Risk Premium," *Journal of International Money and Finance*, Vol. 8, 1989, pp. 147–157.
- "Security Price Response to Quarterly Earnings Announcements and Analyst Forecast Revisions," With W. Landsman. *The Accounting Review*, Vol. 64, October 1989, pp. 680–692.
- "Financing Corporate Growth," With A. Shapiro. *Journal of Applied Corporate Finance*, Vol. 1, summer 1988, pp. 6–22.
- "Measuring the Cost of Corporate Litigation: Five Case Studies," With K. Engelmann. *Journal of Legal Studies*, Vol. 17, June 1988, pp. 135–162.

- "Corporate Stakeholders and Corporate Finance," With A. Shapiro. *Financial Management*, Vol. 16, Spring 1987, pp. 5–14.
- "The Impact on Bank Stock Prices of Regulatory Responses to the International Debt Crisis," With A. Shapiro and W. Landsman. *Journal of Banking and Finance*, Vol. 3, 1987, pp. 161–178.
- "Pricing Interest Rate Swaps: Theory and Empirical Evidence," *Proceeding of Conference on Swaps and Hedges*, Salomon Brothers Center, New York University, 1987.
- "Forecasting the Eleventh District Cost of Funds," *Housing Finance Review*, Vol. 6, Summer 1987, pp. 123–135.
- "Commodity Own Rates, Real Interest Rates, and Money Supply Announcements," With K. French. *Journal of Monetary Economics*, Vol. 18, July 1986, pp. 3–20.
- "The Reaction of Bank Stock Prices to the International Debt Crisis," With A. Shapiro. *Journal of Banking and Finance*, Vol. 10, 1986, pp. 55–73.
- "Inflation Measurement, Inflation Risk, and the Pricing of Treasury Bills," *Journal of Financial Research*, Vol. 9, Fall 1985, pp. 193–202.
- "Interest Rates and Exchange Rates: Some New Empirical Evidence," With A. Shapiro. *Journal of International Money and Finance*, Vol. 4, 1985, pp. 431–442.
- "The Weekly Pattern in Stock Returns: Cash versus Futures," *The Journal of Finance*, Vol. 40, June 1985, pp. 583–588.
- "The Income Approach to Valuation," *Proceedings of the Wichita State University Conference on the Appraisal of Railroads and Public Utilities*, 1985.
- "The Value of Rate Base Options in the Eurocredit Market," With O. Sand. *Journal of Bank Research*, Vol. 16, Spring 1985, pp. 22–28.
- "The Money Supply Announcements Puzzle: Review and Interpretation," *American Economic Review*, Vol. 73, September 1983, pp. 644–658.
- "The Money Supply Announcements Puzzle: Reply," *American Economic Review*, Vol. 75, June 1985, pp. 565–566.
- "Taxes and the Pricing of Stock Index Futures," With K. French. *The Journal of Finance*, Vol. 38, June 1983, pp. 675–695; reprinted in *Proceedings of the Seminar for the Analysis of Securities Prices*, University of Chicago Press, 1983.
- "Money Supply Announcements and Interest Rates: Another View," *Journal of Business*, Vol. 56, January 1983, pp. 1–25; reprinted in *Proceedings of the Seminar for the Analysis of Securities Prices*, University of Chicago Press, 1983.
- "Monetary Policy and the Daily Behavior of Interest Rates," *Journal of Business and Economics*, Vol. 35, 1983, pp. 189–203.
- "Managing Exchange Risk," With A. Shapiro. *Midland Corporate Financial Journal*, Vol. 1, Fall 1983, pp. 16–31; reprinted in *New Developments in International Finance*, J. Stern and D. Chew, eds., Basil Blackwell, New York, 1988.

- "The Pricing of Stock Index Futures," With K. French. *Journal of Futures Markets*, Vol. 3, Fall 1983, pp. 1–14; reprinted in *Readings in Futures Markets,* Vol. 5 and in *Selected Writings on Futures Markets: Explorations in Financial Futures*; both published by the Chicago Board of Trade, 1984.
- "Money Supply Announcements, Interest Rates, and Foreign Exchange," *Journal of International Money and Finance*, Vol. 1, 1982, pp. 201–208.
- "Forward versus Futures Prices: Evidence from the Foreign Exchange Markets," With M. Reinganum. *The Journal of Finance*, Vol. 36, December 1981, pp. 1035–1046.
- "Taxation and the Pricing of Treasury Bill Futures," *The Journal of Finance*, Vol. 36, December 1981, pp. 1169–1176.
- "The Relationship between Volume and Price Variability in Futures Markets," *Journal of Futures Markets*, Vol. 1, Fall 1981, pp. 303–316.
- "Relative vs. Absolute Price Changes: An Empirical Study," *Economic Inquiry*, Vol. 16, April 1981, pp. 302–309.
- "The Consumption Based Asset Pricing Model: A Note on Potential Tests and Applications," *Journal of Financial Economics*, Vol. 9, March 1981, pp. 103–110.
- "Strategies for Pairwise Competitions in Markets and Organizations," With R. Roll. *Bell Journal of Economics*, Vol. 12, Spring 1981, pp. 201–216.
- "What is the Future for Floating Rate Bonds?," *Chase Financial Quarterly*, Vol. 1, Fall 1981, pp. 27–38.
- "The Denomination of Foreign Trade Contracts Once Again," *Journal of Financial and Quantitative Analysis*, Vol. 5, November 1980, pp. 933–945.
- "Inflation, Relative Price Changes, and Exchange Risk," *Financial Management*, Vol. 9, Spring 1980, pp. 30–35.
- "Asymmetric Information and Investment Performance Measurement," *Journal of Financial Economics*, Vol. 7, December 1979, pp. 381–390.
- "Treasury Bill Pricing in the Spot and Futures Markets," With D. Capozza. *Review of Economics and Statistics*, Vol. 61, November 1979, pp. 513–520; reprinted in *Interest Rate Futures: Concepts and Issues*, Robert Dame International, 1981.
- "A Variance Forecasting Test of the Option Pricing Model," With D. Capozza. *Financial Review*, Vol. 7, 1979, pp. 381–390.
- "Relative Price Changes and Deviations from Purchasing Power Parity," *Journal of Banking and Finance*, Vol. 3, 1979, pp. 263–279.
- "A Note on Capital Asset Pricing and the Theory of Indexed Bonds," *Southern Journal of Economics*, Vol. 45, 1979, pp. 1239–1247.
- "Do Money Supply Announcements Affect Short-term Interest Rates?," *Journal of Money, Credit, and Banking*, Vol. 11, February 1979, pp. 80–86.
- "Risk, Currency Substitution, and the Exchange Rate," *Proceedings of the Fall 1978 Conference*, Federal Reserve Bank of San Francisco, 1978.

- "Determinants of the Bid-Ask Spread on Forward Foreign Exchange Contracts Under Floating Exchange Rates," *Journal of International Business Studies*, Vol. 9, Fall 1978, pp. 33–41.
- "Using the Option Pricing Model to Measure the Uncertainty Producing Effect of Major Announcements," *Financial Management*, Vol. 7, Spring 1978, pp. 54–59.
- "Price as a Signal of Quality: Some Additional Experimental Results," *Economic Inquiry*, Vol. 16, April 1978, pp. 302–309.
- "Mean Absolute Deviation versus Least-Square Regression Estimation of Beta Coefficients," With J. Dietrich. *Journal of Financial and Quantitative Analysis*, Vol. 13, March 1978, pp. 123–131.
- "Monetary Policy, Inflation Forecasting, and the Term Structure of Interest Rates," *The Journal of Finance*, Vol. 33, March 1978, pp. 117–127.
- "The Efficiency of the Market for Foreign Exchange Under Floating Exchange Rates," With J. Dietrich. *Review of Economics and Statistics*, Vol. 60, February 1978, pp. 111–120.
- "Option Pricing in Bear and Bull Markets," *The Journal of Portfolio Management*, Vol. 4, Summer 1978, pp. 30–32.
- "Spot Rates, Forward Rates, and Exchange Market Efficiency," *Journal of Financial Economics*, Vol. 5, August 1977, pp. 55–65; reprinted in *Frontiers in International Financial Management*, D. Lessard and J. Wiley, Eds., 1979, and in *International Finance: Concepts and Issues*, R. Kalb and G. Gay, Eds., Robert F. Dame, 1982.
- "Measuring the Informational Content of Consumer Price Announcements," *Nebraska Journal of Economics and Business*, Vol. 16, Summer 1977, pp. 57–64.
- "Which Inflation Rate Affects Interest Rates?," *Business Economics*, Vol. 12, May 1977, pp. 22–25. Reprinted in *Certified Financial Analysts Digest*, 1977.
- "Are Deep Discount Convertibles Underpriced?," *The Journal of Portfolio Management*, Vol. 3, Spring 1977, pp. 55–57.
- "Using the Goldsmith-Nagan Survey to Estimate the Liquidity Premium," *Journal of Economics and Business*, Vol. 2, February 1977, pp. 148–151.
- "Managing Money in a Competitive Securities Market," *Arizona Review*, Vol. 25, September 1976, pp. 1–5.
- "Asset Pricing Under Uncertain Inflation: A Note on the Work of Long and Roll," *Intermountain Economic Review*, Vol. 7, Spring 1976, pp. 85–91.
- "The Arizona Retirement System 1956–1975: An Investment Analysis," *Arizona Review*, Vol. 25, March 1976, pp. 1–9.

Working Papers

- "Energy and Investing," *https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3343583* and https://cornell-capital.com/blog/2019/02/energy-and-investing-a-cornell-capital-report-on-renewable-energy.html.

Book reviews and discussion comments

- "Statistical Analysis of Price and Basis Behavior: October 12–6, 1987," *The Stock Market: Bubbles, Volatility, and Chaos*, E. Dwyer and R. Hafer, eds., Kluwer Academic Publishers, 1990.
- Review of *Futures Markets*, *Journal of Monetary Economics*, M. Streit, ed., Vol. 16, July 1985, pp. 133–135.
- Review of "Exchange Rates and International Macroeconomics," *Journal of International Money and Finance*, J. Frenkel, ed., Vol. 4, 1985, pp. 212–214.
- Review of "Exchange Rate Policy," by Ray A. Batchelor and Geoffrey Wood, *Journal of Economic Literature*, Vol. 21, 1983, pp. 1027–1029.

AWARDS AND HONORS

- Bernstein Fabozzi/Jacobs Levy Award for outstanding research from *The Journal of Portfolio Management*, 2017
- Bernstein Fabozzi/Jacobs Levy Award for outstanding research from *The Journal of Portfolio Management*, 2015
- Graham and Dodd G&D Scroll Award for research on securities analysis and valuation, 2011
- Bernstein Fabozzi/Jacobs Levy Award for outstanding research from *The Journal of Portfolio Management*, 2010
- Graham and Dodd G&D Scroll Award for research on securities analysis and valuation (with Richard Roll), 2006
- I/B/E/S award for research in empirical finance (with W. Landsman and J. Conrad), 1999
- Cited as one of the 10 most prolific research authors in the field of finance in "Most Frequent Contributors to the Finance Literature" by Jean Louis Heck and Phillip L. Cooley, *Financial Management*, Autumn 1988
- Financial Management Association Prize for Applied Research
- Institute for Quantitative Research in Finance, Research Grant Center for the Study of Futures Markets, Research Grant
- Center for the Study of Futures Markets, Research Grant Chicago Mercantile Exchange, Research Grant
- Phi Beta Kappa, Stanford University

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

American Finance Association

Member of Board of Directors	1982–1985
Vice-President	1987

American Economic Association

American Statistical Association

Western Finance Association

SELECTED BOARD AND COMMITTEE MEMBERSHIPS

Board of Advisors, Research Affiliates LLC 2013–Present

Chairman, Mayor Riordan's Blue Ribbon Commission on Los Angeles Municipal Investments

Pension Policy Board, The Aerospace Corporation

Board of Directors, Forms Engineering Corporation

Trustee, Kellow Trust

SPECIAL EDUCATION PROGRAMS

Developed a joint course with Michael Milken on the Impact of the High-Yield Debt Market on Corporate Finance and Corporate Transactions, Fall term 1992, Anderson Graduate School of Management

The U.S. Business School in Prague – Special Finance Program

The Nissan Program for Historically Black Colleges, Director

The Lead Program for Business Education of Minority High School Students

RECENT PRESENTATIONS

The Impact of Inflation on Constant Growth Measures of Value, ASA Business Valuation Conference Keynote, Chicago, IL

Conceptual Foundations of Investing, Rady Innovations in Finance Lecture Series, Rady School of Management, University of California, San Diego, April 10, 2019

Conceptual Foundations of Investing, Keynote Address at Claremont Colleges, Claremont, CA, February 15, 2019

APPENDIX B

BRADFORD CORNELL
DEPOSITION, TRIAL & ARBITRATION TESTIMONY
IN PAST FOUR YEARS

Case Name	Date(s)	Testimony Type
Oaktree Principal Fund V, LP., et al. v. Warburg Pincus LLC, et al.	January 2019	Deposition Testimony
In re: Dow Silicone Corporation (formerly known as Dow Corning Corporation)	September 2018	Deposition Testimony
In re: MPM Silicones, LLC	August 2018	Trial Testimony
In re: MPM Silicones, LLC	July 2018	Deposition Testimony
Ventas, Inc. v. Ernst & Young LLP	April 2018	Arbitration Testimony
In re: General Motors LLC Ignition Switch Litigation	April 2018	Deposition Testimony
BNSF Railway Company and Norfolk Southern Railway Company v. FirstEnergy Generation, LLC, f/k/a FirstEnergy Generation Corporation	February 2018	Deposition Testimony
Ventas, Inc. v. Ernst & Young, LLP	February 2018	Deposition Testimony
In re: Lehman Brothers Holdings Inc., et al.	January 2018	Trial Testimony
In re: ExamWorks Group, Inc. Stockholder Appraisal Litigation	January 2018	Deposition Testimony
In re: Lehman Brothers Holdings Inc., et al.	October 2017	Deposition Testimony
JCM Innovation Corp. and JCM American Corporation v. FL Acquisition Holdings, Inc. and American Capital, Ltd.	September 2017	Deposition Testimony
Building Materials Corporation of America v. Paramount Petroleum Corporation	August 2017	Deposition Testimony
In re: Appraisal of Solera Holdings, Inc.	June 2017	Trial Testimony
The People of the State of California, acting by and through Orange County District Attorney Tony Rackauckas v. General Motors LLC	June 2017	Deposition Testimony

APPENDIX B

Case Name	Date(s)	Testimony Type
Behindthechair.com, Inc. v. Dean Christal, Olaplex LLC, a California limited liability company; LiQWD, Inc., a California corporation; and DOES 1-10, inclusive	June 2017	Deposition Testimony
In re: Appraisal of Solera Holdings, Inc.	May 2017	Deposition Testimony
The People of the State of California, acting by and through Orange County District Attorney Tony Rackauckas v. General Motors LLC	April 2017	Deposition Testimony
In re: Appraisal of AOL, Inc.	March 2017	Trial Testimony
Babak Hatamian, et al. v. Advanced Micro Devices, Inc., et al.	February 2017	Deposition Testimony
In re: Appraisal of AOL, Inc.	February 2017	Deposition Testimony
Tesoro Refining & Marketing Company LLC, a Delaware limited liability company, Claimant v. Demenno-Kerdoon, Inc., a California corporation, and DOES 1 through 10, inclusive, Respondents., Demenno-Kerdoon, Inc., a California corporation, and Ribost Terminal, LLC, a California limited liability company, Counterclaimants, v. Tesoro Refining & Marketing Company LLC, a Delaware limited liability company, Counter-Respondent.	January 2017	Deposition Testimony
Tesoro Refining & Marketing Company LLC, a Delaware limited liability company, Claimant v. Demenno-Kerdoon, Inc., a California corporation, and DOES 1 through 10, inclusive, Respondents., Demenno-Kerdoon, Inc., a California corporation, and Ribost Terminal, LLC, a California limited liability company, Counterclaimants, v. Tesoro Refining & Marketing Company LLC, a Delaware limited liability company, Counter-Respondent.	November 2016	Deposition Testimony
ITW Global Investments Inc. v. American Industrial Partners Capital Fund IV, L.P., American Industrial Partners Capital Fund IV (Parallel), L.P., and AIPCF IV, LLC	November 2016	Deposition Testimony

APPENDIX B

Case Name	Date(s)	Testimony Type
ACP Master, Ltd., Aurelius Capital Master, Ltd., and Aurelius Opportunities Fund II, LLC v. Sprint Corporation, Sprint Communications, Inc., Erik Prusch, John W. Stanton, William R. Blessing, Bruce A. Chatterley, Mufit Cinali, Jose A. Collazo, Hossein Eslambolchi, Dennis S. Hersch, Brian P. McAndrews, Kathleen H. Rae, Theodore H. Schell, Jennifer L. Vogel, Slade Gorton, Starburst I, Inc. and Softbank Corp. (ACP Master, Ltd., et al. v. Clearwire Corporation)	October 2016	Trial Testimony
Tiffany and Co. v. Costco Wholesale Corp.	September 2016	Trial Testimony
Spin Master Ltd. v. Bureau Veritas Consumer Products Services, Inc. and Eurofins Product Safety Labs	September 2016	Deposition Testimony
Kraft Foods Group Brands LLC v. TC Heartland, LLC, et al.	June 2016	Deposition Testimony
Iheartcommunications, Inc., f/k/a Clear Channel Communications, Inc. v. Benefit Street Partners LLC, Providence TMT Debt Opportunity Fund II LP, Providence Debt Fund III Master (Non-US) L.P., Providence Debt Fund II, L.P., Benefit Street Partners Capital Opportunity Fund LP, PECM Strategic Funding LP, Benefit Street Credit Alpha Fund LTD, US High Yield Bond Fund, SEI Institutional Investments Trusts - High Yield Bond Fund, SEI Global Master Fund PLC - The SEI High Yield Fixed Income Fund, Schroder Gaia Canyon Capital Advisors, LLC, D.E. Shaw Galvanic Portfolios, LLC, M.H. Davidson & Co., Davidson Kempner Partners, Davidson Kempner International, Ltd., Davidson Kempner Institutional Partners, L.P., Islington Partners, L.P., Bluejay Securities LLC, Franklin Mutual Advisers, LLC, Franklin Advisers, Inc., et al.	May 2016	Trial Testimony
Iheartcommunications, Inc., f/k/a Clear Channel Communications, Inc. v. Benefit Street Partners LLC, Providence TMT Debt Opportunity Fund II LP, Providence Debt Fund III Master (Non-US) L.P., Providence Debt Fund II, L.P., Benefit Street Partners Capital Opportunity Fund LP, PECM Strategic Funding LP, Benefit Street Credit Alpha Fund LTD, US High Yield Bond Fund, SEI Institutional Investments Trusts - High Yield Bond Fund, SEI Global Master Fund PLC - The SEI High Yield Fixed	May 2016	Deposition Testimony

APPENDIX B

Case Name	Date(s)	Testimony Type
Income Fund, Schroder Gaia Canyon Capital Advisors, LLC, D.E. Shaw Galvanic Portfolios, LLC, M.H. Davidson & Co., Davidson Kempner Partners, Davidson Kempner International, Ltd., Davidson Kempner Institutional Partners, L.P., Islington Partners, L.P., Bluejay Securities LLC, Franklin Mutual Advisers, LLC, Franklin Advisers, Inc., et al.		
Iheartcommunications, Inc., f/k/a Clear Channel Communications, Inc. v. Benefit Street Partners LLC, Providence TMT Debt Opportunity Fund II LP, Providence Debt Fund III Master (Non-US) L.P., Providence Debt Fund II, L.P., Benefit Street Partners Capital Opportunity Fund LP, PECM Strategic Funding LP, Benefit Street Credit Alpha Fund LTD, US High Yield Bond Fund, SEI Institutional Investments Trusts - High Yield Bond Fund, SEI Global Master Fund PLC - The SEI High Yield Fixed Income Fund, Schroder Gaia Canyon Capital Advisors, LLC, D.E. Shaw Galvanic Portfolios, LLC, M.H. Davidson & Co., Davidson Kempner Partners, Davidson Kempner International, Ltd., Davidson Kempner Institutional Partners, L.P., Islington Partners, L.P., Bluejay Securities LLC, Franklin Mutual Advisers, LLC, Franklin Advisers, Inc., et al.	April 2016	Trial Testimony
Iheartcommunications, Inc., f/k/a Clear Channel Communications, Inc. v. Benefit Street Partners LLC, Providence TMT Debt Opportunity Fund II LP, Providence Debt Fund III Master (Non-US) L.P., Providence Debt Fund II, L.P., Benefit Street Partners Capital Opportunity Fund LP, PECM Strategic Funding LP, Benefit Street Credit Alpha Fund LTD, US High Yield Bond Fund, SEI Institutional Investments Trusts - High Yield Bond Fund, SEI Global Master Fund PLC - The SEI High Yield Fixed Income Fund, Schroder Gaia Canyon Capital Advisors, LLC, D.E. Shaw Galvanic Portfolios, LLC, M.H. Davidson & Co., Davidson Kempner Partners, Davidson Kempner International, Ltd., Davidson Kempner Institutional Partners, L.P., Islington Partners, L.P., Bluejay Securities LLC, Franklin Mutual Advisers, LLC, Franklin Advisers, Inc., et al.	March 2016	Deposition Testimony
Sequoia Pacific Solar I, LLC v. United States	March 2016	Deposition Testimony

APPENDIX B

Case Name	Date(s)	Testimony Type
Lawrence E. Jaffe Pension Plan, On Behalf of Itself and All Others Similarly Situated v. Household International, Inc., et al.	March 2016	Deposition Testimony
Tinicum Capital Partners II, L.P., and Tinicum Capital Partners II Parallel Fund, L.P. v. Liberman Broadcasting, Inc., Lenard Liberman, Jose Liberman, Winter Horton, Rockard J. Delgadillo, and Peter Connoy	February 2016	Deposition Testimony
Move, Inc., RealSelect, Inc., Top Producer Systems Company, National Association of Realtors, Realtors Information Network, Inc. v. Zillow, Inc., Errol Samuelson, Curt Beardsley, and DOES 1-20	February 2016	Deposition Testimony
ACP Master, Ltd., Aurelius Capital Master, Ltd., and Aurelius Opportunities Fund II, LLC v. Sprint Corporation, Sprint Communications, Inc., Erik Prusch, John W. Stanton, William R. Blessing, Bruce A. Chatterley, Mufit Cinali, Jose A. Collazo, Hossein Eslambolchi, Dennis S. Hersch, Brian P. McAndrews, Kathleen H. Rae, Theodore H. Schell, Jennifer L. Vogel, Slade Gorton, Starburst I, Inc. and Softbank Corp. (ACP Master, Ltd., et al. v. Clearwire Corporation)	November 2015	Deposition Testimony
In re: The Boeing Company and Boeing Commercial Space Company v. KB Yuzhnoye; PO Yuzhnoye; Mashinostroitelny Zavod; S.P. Korolev Rocket and Space Corporation; Energia D/B/A Rocket and Space Corporation Energia After S.P. Korolev; Energia Overseas LLC; and Energia Logistics Ltd.	November 2015	Trial Testimony
In re: Caesars Entertainment Operating Company, Inc., Debtor	October 2015	Trial Testimony
In re: Appraisal of Dell, Inc.	October 2015	Trial Testimony
In re: the Marriage of: Kenneth C. Griffin and Anne Dias Griffin	October 2015	Deposition Testimony
In re: Caesars Entertainment Operating Company, Inc., Debtor	September 2015	Deposition Testimony
Building Materials Corporation of America v. Paramount Petroleum Corporation	September 2015	Deposition Testimony

APPENDIX B

Case Name	Date(s)	Testimony Type
The Nutro Company v. Paragon Pet Products USA, Inc., et al.	August 2015	Deposition Testimony
In re: Appraisal of Dell, Inc.	August 2015	Deposition Testimony
In re: Surface Transportation Board Docket No. EP 722 & EP 664 (Sub-No. 2)	July 2015	Hearing Testimony
Magnetar Global Event Driven Master Fund Ltd., et al. v. CEC Entertainment, Inc.	June 2015	Deposition Testimony
In re: The Boeing Company and Boeing Commercial Space Company v. KB Yuzhnoye; PO Yuzhnoye; Mashinostroitelny Zavod; S.P. Korolev Rocket and Space Corporation; Energia D/B/A Rocket and Space Corporation Energia After S.P. Korolev; Energia Overseas LLC; and Energia Logistics Ltd.	May 2015	Deposition Testimony
In re: the Marriage of: Kenneth C. Griffin and Anne Dias Griffin	April 2015	Deposition Testimony
Georgia-Pacific Consumer Products LP, et al. v. NCR Corporation, et al.	March 2015	Deposition Testimony