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April 9, 2007

VIA HAND-DELIVERY
Chairman Sara Kyle
c/o Sharla Dillon
Tennessee Regulatory Authority
460 James Robertson Parkway
Nashville, Tennessee 37243-0505

Re: Petition Of Tennessee American Water Company To Change And Increase Certain Rates And Charges So As To Permit It To Earn A Fair And Adequate Rate Of Return On Its Property Used And Useful In Furnishing Water Service To Its Customers; Docket No. 06-00290

Dear Chairman Kyle:

Enclosed please find an original and sixteen (16) copies of Rebuttal Testimony of Michael J. Vilbert.

Please return three copies of each Rebuttal, which I would appreciate your stamping as "filed," and returning to me by way of our courier.

Should you have any questions concerning any of the enclosed, please do not hesitate to contact me.

With kindest regards, I remain

Yours very truly,

Dale Grimes by /s/ [illegible]
R. Dale Grimes
w/permission

RDG/ms
Enclosures

cc: Hon. Pat Miller (*w/o enclosure*)
Hon. Ron Jones (*w/o enclosure*)
Hon. Eddie Roberson (*w/o enclosure*)
Ms. Darlene Standley, Chief of Utilities Division (*w/o enclosure*)
Richard Collier, Esq. (*w/o enclosure*)
Mr. Jerry Kettles, Chief of Economic Analysis & Policy Division *(w/o enclosure*)
Ms. Pat Murphy (*w/o enclosure*)
Michael A. McMahon, Esq. (*w/enclosure*)
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Henry Walker, Esq. (*w/enclosure*)
David Higney, Esq. (*w/enclosure*)
Mr. John Watson (*w/enclosure*)
Mr. Michael A. Miller (*w/enclosure*)

BEFORE THE
TENNESSEE REGULATORY AUTHORITY

REBUTTAL TESTIMONY OF

MICHAEL J. VILBERT

ON BEHALF OF

TENNESEE-AMERICAN WATER

CASE NO. 06-00290

CONCERNING

COST OF CAPITAL

APRIL 6, 2007

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I. INTRODUCTION AND SUMMARY

A. INTRODUCTION

Q1. Please state your name, address and position.

A1. My name is Michael J. Vilbert, and I am a Principal at *The Brattle Group*, 44 Brattle Street, Cambridge, MA 02138

Q2. Did you previously file testimony in this proceeding?

A2. Yes, I filed Direct Testimony ("Vilbert Direct") on behalf of Tennessee-American Water Company ("Tennessee-American" or the "Company") in November 2006 regarding return on equity that the Company should be allowed an opportunity to earn.

Q3. What is the purpose of your rebuttal testimony?

A3. I have been asked by Tennessee-American to respond to the Testimony of Dr. Steve Brown ("Brown Testimony") on behalf of the Office of the Attorney General regarding the Brown Testimony's recommended return on equity and proposed capital structure for the Company. I have also been asked to respond to the Brown Testimony's criticism of the Vilbert Direct.

B. SUMMARY

Q4. Please summarize your rebuttal testimony.

A4. This rebuttal testimony focuses on several topics stemming from the Brown Testimony. First, in my opinion, the Brown Testimony's recommended rate of return on equity of 7.5 percent on a capital structure with effectively 25.6 percent equity is unlikely to meet the Supreme Court's requirements specified in the *Hope Natural Gas* and the *Bluefield Waterworks* cases. Specifically, the Supreme Court has ruled that a utility must be allowed a fair opportunity to earn a rate of return commensurate with that earned on comparable risk investments, and that the return should be sufficient to attract capital and maintain the firm's financial integrity. Second, the Brown Testimony's criticism of the

Vilbert Direct's implementation of both the Dividend Valuation ("DCF") model and the Capital Asset Pricing Model ("CAPM") is generally misleading, makes frequent factual errors, and takes statements out of context and misconstrues their meaning. As part of the discussion of the models, I will address the following issues raised by the Brown Testimony: the likely effect of the 2003 tax cut on dividend income, the difficulty of estimating the appropriate growth rate for use in the DCF model and the estimation of beta and the market risk premium ("MRP") for the CAPM.

II. ALLOWED RETURN ON EQUITY AND THE NEED FOR CAPITAL INVESTMENT IN THE WATER INDUSTRY

Q5. The Brown Testimony recommends that Tennessee-American be allowed an opportunity to earn a return on equity of 7.5 percent on a regulatory capital structure with 30 percent equity.[1] Do you have any general comments?

A5. Yes. First, the regulatory capital structure effectively has only about 25.6 percent equity when the so-called double leverage adjustment is considered.[2] This point is discussed further below. Second, the return on equity estimated in the Brown Testimony is only 140 basis points greater than the current yield on Baa-rated utility bonds (March 2007).[3] After applying the double leverage adjustment, the Brown Testimony's recommended weighted average cost of capital is 6.4 percent, a value only 30 basis points higher than the yield on a Baa-rated utility bond. This is an unusually low risk premium to grant equity investors particularly for a company with a capital structure including only 25.6 percent equity. The Federal Energy Regulatory Commission ("FERC"), for example, typically rejects as unrealistic any estimate of the cost of capital for a sample company that does not exceed the company's cost of debt by more than 100 basis points, and then

[1] Brown Testimony at 18: 6-7.

[2] This is 85.3 percent (financing from parent) x 30 percent (recommended equity ratio) = 25.59 percent. See Schedule 9, Brown Testimony.

[3] The yield on BBB rated utility bonds was 6.10 in March 2007 and was 6.61 August 2006 when the Vilbert Direct was filed. See Mergent Bond Record, March 2007.

sets a "zone of reasonableness" that ranges from a low equal to the cost of debt plus 100 basis points to a high equal to the highest DCF estimate from the FERC method.

Finally, the Brown Testimony's recommended return on equity is significantly below the allowed returns on equity and equity ratios that have been granted in recent water utility cases in other jurisdictions as documented in the rebuttal testimony of Mr. Michael A. Miller, Treasurer and Comptroller of Tennessee-American.[4,5]

Q6. If adopted, what effect would the Brown Testimony's recommendations be likely to have on the credit rating of the Company?

A6. On a stand alone basis for Tennessee-American, the Brown Testimony's recommendations, if adopted, would be consistent with a Standard & Poor's ("S&P") credit rating of less than investment grade (i.e., less than BBB-) based upon the interest coverage ratios and the debt to total capital ratio. Of course, the actual credit rating awarded by S&P depends upon factors in addition to the financial ratios, but Table MJV-R1 below shows that the expected (i.e., pro forma) financial ratios resulting from the Brown Testimony's recommendations would not satisfy the requirements of an investment grade bond rating. Table MJV-R2 shows S&P's ratio guidelines by business profile.[6] Comparison of the ratios for Tennessee-American from Table MJV-R1 to S&P's guidelines in Table MJV-R2 shows that all of the Tennessee-American's pro forma ratios would be lower than the bottom of the range for a BB rating, except for the EBIT interest coverage ratio which is in the BB range. In other words if adopted, the Brown Testimony's recommendations would relegate the Company's ratios to junk status and make the entity a likely candidate for a non-investment grade credit rating.

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[4] Rebuttal Testimony of Michael Miller, Treasurer and Comptroller of Tennessee-American.

[5] In September 2006, the California PUC granted Southwest Water Company an allowed return on equity of 10%, in January 2007, the Connecticut Department of Public Utility Control allowed Connecticut Water an allowed return on ratebase of 8.07% (ROE was 10.125%), and in March 2007 the Arizona Corporation Commission granted Arizona-American Water Company an allowed return on equity of 10.7%. See Southwest Water Announces CPUC Decision in Southern California Rate Case, Press Release September 26, 2006, and Connecticut Water Service, Inc. Announces Rate Case Decision, January 17, 2007, and Opinion and Order in Docket No. WS-01303A-06-0014.

Table MJV-R1

TAWC Financial Ratio Summary

Based on Dr. Brown's Capital Structure Recommendation and Double Leverage Adjustment

		Double Leverage Adjustment [1]	[2]	[3]		Sources and Notes
[A]	Total Outside Financing	14.7%		**14.7%**	Debt	Brown Testimony, Schedule 8
[B]	Financing From Parent	85.3%			Equity	Brown Testimony, Schedule 8
[C]	Parent Financing is Assumed to be 70% Debt		70.0%	**59.7%**	Debt	[2][C] x [1][B]
[D]	and 30% Equity		30.0%	**25.6%**	Equity	[2][D] x [1][B]
		100.0%		**100.0%**		
[E]	Cost of Debt	6.1%				Miller Rebuttal, Exhibit MAM-6
[F]	Cost of Equity	7.5%				Brown Testimony, Recommendation
[G]	Tax Rate	39.2%				Vilbert Direct, pp. 14.
[H]	Depreciation Rate	2.6%				TAWC Exhibit No. 2, Schedule 4 page 2 of 2
[I]	Earnings Before Interest and Taxes (EBIT)	7.7%				([F] x [D] / (1 - [G])) + [E] x ([A] + [C])
[J]	Funds from Operations (FFO)	4.5%				[F] x [D] + [H]
[K]	Weighted-Average Interest Expense	4.5%				[E] x ([A] + [C])

TAWC PRO FORMA FINANCIAL RATIOS*		
EBIT interest coverage (x)	1.7	[I] / [K]
Total debt/Total debt + equity (%)	74.4	([A] + [C]) x 100
FFO interest coverage (x)	1.0	[J] / [K]
FFO/average total debt (%)	6.0	([J] / ([A] + [C])) x 100

* Estimated financial ratios if the Brown Testimony's recommendations were adopted.

[6] Business profiles range from 1 (lowest business risk) to 10 (highest business risk). Neither American Water nor Tennessee-American currently has a business profile rating from S&P.

Table MJV-R2

S&P Key Financial Ratios, by Business Risk Profile

Pretax Interest Coverage						
Business Profile	**A**	**A**	**BBB**	**BBB**	**BB**	**BB**
3	3.4	2.8	2.8	1.8	1.8	1.1
4	4	3.3	3.3	2.2	2.2	1.3
5	4.3	3.5	3.5	2.4	2.4	1.5
Total Debt to Total Capital (%)						
Business Profile	**A**	**A**	**BBB**	**BBB**	**BB**	**BB**
3	50	55	55	65	65	70
4	45	52	52	62	62	68
5	42	50	50	60	60	65
Funds from Operations/interest coverage						
Business Profile	**A**	**A**	**BBB**	**BBB**	**BB**	**BB**
3	3.5	2.5	2.5	1.5	1.5	1
4	4.2	3.5	3.5	2.5	2.5	1.5
5	4.5	3.8	3.8	2.8	2.8	1.8
Funds from Operations/total debt (%)						
Business Profile	**A**	**A**	**BBB**	**BBB**	**BB**	**BB**
3	25	15	15	10	10	5
4	28	20	20	12	12	8
5	30	22	22	15	15	10

Source:
"Research: New Business Profile Scores Assigned for U.S. Utility and Power Companies; Financial Guidelines Revised," S&P Ratings Direct, June 2, 2004.
Pretax interest coverage figures from "Research: Utility Financial Targets Are Revised," S&P Ratings Direct, June 18, 1999.

Q7. The Brown Testimony argues that water utilities are "safe" companies.[7] Do you agree?

A7. In general, yes. While I agree that water utilities traditionally have been viewed as relatively safe compared to many other industries, the risk of the equity invested in the industry is not equivalent to the risk of debt, as the overall return on capital that the Brown Testimony recommends would suggest. Moreover, the risk of the water industry is increasing. While publicly traded water utilities in the U.S. generally have good credit

[7] Brown Testimony at 38-39.

ratings, Moody's Investors Service ("Moody's") and S&P note the need for significant capital expenditure, the costs of complying with environmental and security regulation as sources of risk.[8] Fitch notes that the debt ratios are increasing.[9] At the same time the regulatory requirements to the water industry are evolving.[10] This increase in risk is documented by the increasing average estimated betas by *Value Line Investment Survey* ("*Value Line*") for the water sample which is shown below in Figure MJV-R1. *Value Line's* estimated betas for the water utility companies covered as of the last report for each year since 1995 have increased from an average of about 0.50 in 1995 to an average of about 0.70 in 2006. *Value Line* clearly believes that the average risk of the industry is increasing.

[8] Moody's *Credit Risks Are Increasing for U.S. Investor Owned Water Utilities*, Special Comment, January 2004, S&P *Key Rating Factors for Water Companies Around the World*, July 17, 2006.

[9] Fitch Ratings, 2007 Median Ratios for Water and Sewer Revenue Bonds – Retail Systems.

[10] For example, the Ground Water Rule was signed in November 2006.

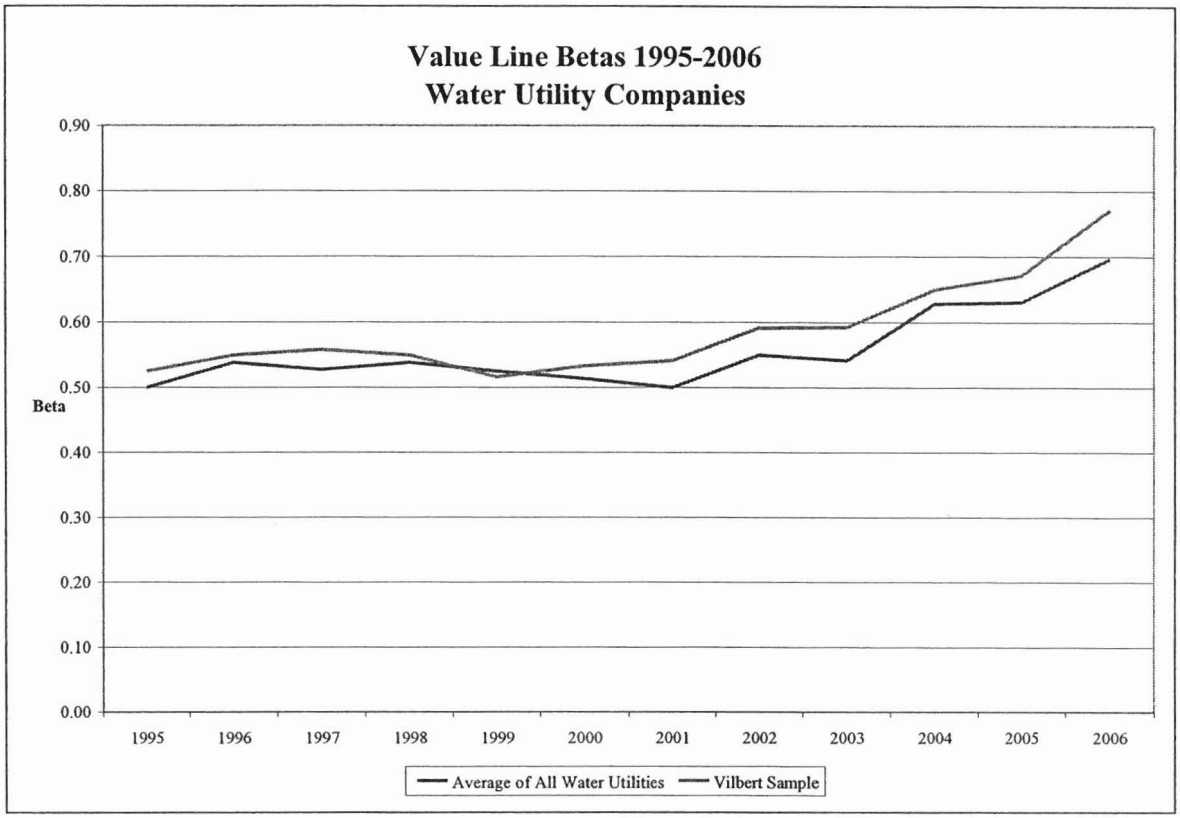

Figure MJV-R 1

Q8. Previously you stated that the water industry needs to undertake substantial capital expenditures going forward. Would you please elaborate?

A8. Yes. The Environmental Protection Agency ("EPA") has indicated that the water industry needs to invest capital of about $224 billion over the next two decades to meet the nation's need for clean drinking water and for waste water disposal.[11] Indeed, the American Society of Civil Engineers has estimated that drinking water infrastructure needed in Tennessee will be $1.4 billion over the next two decades, with an additional $650 million for waste water infrastructure.[12] Similarly, *Value Line* notes the need for investment totaling "hundreds of millions of dollars over the next two decades" by the utilities it follows in the water industry as the EPA continues to increase its water

[11] www.epa.gov/waterinfrastructure/infrastructuregap.html

[12] See, 2005 Report Card for America's Infrastructure, available at www.asce.org.

purification standard. [13] In addition, the need to provide security against acts of terrorism and to replace aging water mains will add to the required investment. This is a substantial investment requirement for a group of companies that *Value Line* estimates to have an annual profit of below $150 million.[14] *Value Line* also notes that "[m]any of the smaller companies in the industry do not have the resources to meet the capital expenditures that they are being saddled with. Some are deciding to merge with larger, more financially sound enterprises."[15]

Q9. What are the implications of the need for infrastructure investment and the increasing risks for the industry on the cost of capital?

A9. Financing the needed infrastructure investment means that the industry must attract investor capital. Investors choose to fund investments for which the expected return on their capital corresponds to the risk of the investment. As explained in detail the Vilbert Direct, the return on equity that investors require increases with the risks inherent in the investment.[16] Maintaining a financially strong company will be essential if Tennessee-American is to acquire the capital it needs to fund the necessary investments. An allowed rate of return on equity of 7.5 percent on 25.6 percent equity is not consistent with an investment grade credit rating, and such a return would be unlikely to enable the Company to attract the capital necessary to make needed infrastructure investments.

III. CAPITAL STRUCTURE ISSUE

Q10. The Brown Testimony recommends that the capital structure for American Water Company, Tennessee-American's parent, be set at 30 percent equity.[17] Is this recommendation consistent with the capital structures of the water sample?

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[13] *Value Line Investment Survey*, Water Utilities, January 26, 2007, p. 1417.

[14] *Ibid*, p. 1417.

[15] *Ibid*, p. 1417.

[16] Vilbert Direct at 5-8.

[17] Brown Testimony at 13: 8-10.

A10. No. The amount of equity in the book value capital structures of the companies in the water sample used in both the Vilbert Direct and the Brown Testimony (henceforth the "water sample") are displayed below in Table No. MJV-R3. No company in the sample has a book equity thickness of less than 40 percent, and the average equity percentage in the 3rd quarter of 2006 is almost 51 percent. Clearly, a capital structure recommendation of 30 percent is unreasonable and not in line with the capital structures of the other companies in the water sample.

Table No. MJV-R3

Book Value Equity Ratios of the Companies in the Water Utility Sample

Company	3rd Quarter 2006	2005	2004	2003	2002	2001	Company Average
American States Water Co	48.6%	47.1%	47.8%	42.6%	43.3%	43.3%	45.4%
California Water Service Group	50.0%	51.3%	50.7%	46.9%	43.9%	48.2%	48.5%
Connecticut Water Service Inc	55.3%	52.4%	54.5%	52.4%	52.4%	50.7%	53.0%
Middlesex Water Co	40.5%	41.9%	42.0%	40.9%	41.1%	40.6%	41.2%
Aqua America Inc	48.4%	43.8%	45.1%	44.2%	40.2%	42.4%	44.0%
SJW Corp	58.2%	57.4%	56.2%	54.3%	58.3%	57.6%	57.0%
Southwest Water Co	55.3%	53.2%	51.5%	57.2%	49.4%	52.5%	53.2%
York Water Co	50.2%	49.3%	48.1%	54.5%	53.2%	52.3%	51.3%
Average	50.8%	49.6%	49.5%	49.1%	47.7%	48.4%	

Sources: Book Values pulled from Bloomberg as of April 2, 2007.

Q11. How does the Brown Testimony justify its recommended capital structure?

A11. The Brown Testimony's main support for its recommended capital structure is a vague concern that American Water would "deplete" Tennessee-American's equity,[18] but the Brown Testimony provides no rationale for why American Water would do such a thing, how depleting Tennessee-American's equity would be in the interest of American Water or how ratepayers would be harmed even if American Water were to do such a thing.

Q12. What about the response to Discovery Request No. 15 inquiring as to American Water's incentive to deplete Tennessee-American's equity? Does that response, asserting exorbitant fees or issues with an IPO, provide a rational explanation of an incentive for American Water to deplete the Company's equity and how it would harm ratepayers?

A12. No, not in my opinion. First, the rates charged to Tennessee-American's customers are derived from cost-of-service rate making based upon an original cost rate base. All costs to be recovered by the Company must be reviewed by the Tennessee Regulatory Authority (the "Authority" or "TRA"), just as the costs are for any regulated entity. The TRA could easily prevent the Company from passing on to customers any exorbitant fees American Water may attempt to charge its subsidiaries. Second, the Company's rate base (i.e., its investment in water purification, transmission and distribution assets) is unaffected by the movement of funds between the parent and its subsidiaries, and it is the rate base and approved costs of service that are important for setting rates. Third, nothing in the response to the Discovery Request provides any way in which the Company's customers would be hurt by funds flowing between the parent and the subsidiaries. Once rates are in effect for Tennessee-American, any changes in the capital structure of either the parent or the subsidiary would have no effect on rate payers. Moreover, moving funds from the subsidiary to the parent is akin to moving funds from one pocket to another. In total, the parent is not better off.

Q13. What about the concerns expressed that American Water and its parent RWE have an incentive to enhance the value of the proposed IPO?

A13. The Security Exchange Commission ("SEC") requires very strict adherence to disclosure rules for an IPO, so investors will have full knowledge of the assets and associated liabilities of American Water before investing in the IPO. The more liabilities allocated to America Water relative to the value of the assets being transferred, the less value will be realized in the IPO.

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[18] Brown Testimony at 10: 10-12.

In addition, the evidence on the performance of previous IPOs is not strictly relevant to the American Water IPO given that the vast majority of the IPOs in the study referenced in Discovery Response 15 are for companies going public for the first time. This is clearly not the case with American Water Company. The market (i.e., investors) is well aware of the kind of evidence on the post-IPO performance of companies going public. In any case, investors will take that information as well as all other publicly available information into account when bidding for the IPO. In short, it is hard to see how American Water could "play games" that would benefit it at the expense of Tennessee-American's rate payers because of the constraints of the regulatory process, the SEC and the market.

Q14. What other evidence does the Brown Testimony rely on to support its recommendation of a capital structure with 30 percent equity and 70 percent debt?

A14. The only support is a quotation from AWK's 10k from March 2002, more than 5 years ago, suggesting that the debt ratio would be 70 percent after redemption of preferred stock.[19] The Company has provided confidential information regarding American Water's expected capital structure after the IPO which shows that the expected equity ratio will be substantially higher than 30 percent.[20]

Q15. Do you have any final comments on the Brown Testimony's recommended capital structure?

A15. Yes. The Brown Testimony ignores the effect of financial risk on the cost of equity. It is standard financial theory that the cost of equity increases with financial risk (i.e., with the use of more debt in the capital structure). This issue was discussed at length in the Vilbert Direct.[21] The Brown Testimony recommends decreasing the percentage of equity in the capital structure and simultaneously reducing the allowed return on equity. This is inconsistent with financial theory because of the increased financial risk inherent in a capital structure with more debt. The situation is made worse by the Brown

[19] See Schedule 2, p. 1 of 1, Brown Testimony.

[20] See the Highly Confidential pro forma spreadsheet provided by the Company (not attached to this rebuttal).

[21] Appendix D, Vilbert Direct. See also Chapters 17-19, Brealey, Myers and Allen, op cit.

Testimony's double leverage adjustment which results in an effective equity ratio of only 25.6 percent.

Q16. Please describe the Brown Testimony's double leverage adjustment.

A16. The Brown Testimony's double leverage calculations are presented in Schedule 8. The schedule claims that 85.3 percent of Tennessee-American's financing comes from the parent, and that the weighted-average cost of capital for the parent's capital is 6 percent. When combined with the cost of the 14.7 percent financing not from the parent, the result is an overall cost of capital of 6.4 percent. As noted above, this is only 30 basis points higher than the yield on BBB rated utility bonds[22] for a capital structure that effectively has 74.4 percent debt. This outcome is not credible.

Q17. Please elaborate on why a weighted-average cost of capital for Tennessee-American of 6.4 percent is not credible.

A17. First, it is extremely unlikely that a regulated utility with 74.4 percent debt would and with an allowed return on equity of 7.5 percent would have an investment grade credit rating on a stand alone basis. If the Company were not investment grade, its cost of debt would be higher than 6.4 percent not even considering the cost of equity. Second, a company with the financial and business risk of a regulated utility with a capital structure with 74.4 percent debt would have a cost of equity capital far in excess of 7.5 percent. None of the companies in the water sample have a capital structure with 74.4 percent debt, so even the Brown Testimony's own cost of capital analysis is not applicable to such a highly leveraged company. Moreover, the 14.7 percent debt financing not from the parent in Schedule 8 of the Brown Testimony has a cost of 9.3 percent, 290 basis points higher than the 6.4 weighted-average cost of capital and 180 basis points higher than the cost of equity the Brown Testimony recommends. A cost of equity less than the cost of debt is clear evidence that the cost of equity has been misestimated.

[22] The yield on BBB rated utility bonds was 6.10 in March 2007 and was 6.61 August 2006 when the Vilbert Direct was filed. See Mergent Bond Record, March 2007.

Q18. Please summarize your comments on the Brown Testimony's recommended return and capital structure.

A18. The Brown Testimony's recommendations are inconsistent with the allowed returns on equity of comparable water utilities, inconsistent with the capital structures of the water sample companies and inconsistent with financial theory. If adopted, the Company will be unlikely to attract the capital it requires to finance needed infrastructure investments, and it would likely lead to a credit rating downgrade if Tennessee-American were evaluated on a stand alone basis, i.e., the allowed return and capital structure would not maintain the financial integrity of the Company. In other words, the Brown Testimony's recommended return on equity and capital structure are so low as to be highly unlikely to meet the standards set by the Supreme Court. For these reasons, the Authority should completely disregard the Brown Testimony's cost of capital recommendations

IV. THE 2003 DIVIDEND TAX CUT

Q19. The Brown Testimony argues that the Vilbert Direct failed to take the 2003 dividend tax cut into account and thereby "tossed aside a sea-change in the nation's economic policy."[23] Is this an accurate assessment of the Vilbert Direct?

A19. No. It is difficult to understand how the Brown Testimony concluded that the Vilbert Direct ignores the 2003 dividend tax cut when the Vilbert Direct explicitly discusses the effect of personal income taxes in Appendix D, pp. D-6 to D-8 including the likely effect of the 2003 dividend tax cut. The Brown Testimony is correct that the Vilbert Direct failed to report that Congress had extended the dividend tax cut through 2010, but that omission does not change the conclusions on the likely effect of the dividend tax cut on the cost of capital.

Q20. Why would the extension of the reduction in taxes on dividends not change your opinion regarding the cost of capital for Tennessee-American?

---

[23] Brown Testimony at 27:1-2.

A20. My comments fall into two categories. First, the Vilbert Direct's analyses rely primarily (and in the case of the DCF method exclusively) on market data obtained *after* the implementation of the 2003 dividend tax cut, so whatever effect the 2003 dividend tax cut has had on the cost of capital, it is already reflected in the samples' cost of capital estimates. Second, the paper by Raj Chetty and Emmanuel Saez[24] relied upon by the Brown Testimony in support of its view that the dividend tax cut represented a "sea-change in the nation's economic policy", does not even discuss the effect of the dividend tax cut on the cost of capital. Moreover, as noted in Appendix D of the Vilbert Direct, it is extremely difficult to untangle the effect on the cost of capital resulting from a change in personal income tax rates on dividend income from the many other factors that affect stock prices and the cost of capital. This problem has a long history which is also reflected in comments by Chetty and Saez.[25] More discussion on this paper is below.

Q21. Please describe how the 2003 dividend tax cut is reflected in the Vilbert Direct's estimated cost of equity.

A21. The DCF model by definition is a forward looking model that relies on current or predicted data. In keeping with the forward looking nature of the model, the Vilbert Direct relied exclusively on current dividend and price information and *forward looking* growth rates estimates provided by securities analysts as of September 2006. Consequently, the DCF model uses no data from before the passage of the 2003 tax act[26], and therefore any impact on the cost of capital from the passage of the act would already be reflected in the data used in the Vilbert Direct.

In addition, to estimate the cost of equity for the Company, the Vilbert Direct relied primarily on the risk positioning model described in the Vilbert Direct.[27] This model uses a forward looking risk-free rate, an estimate of the sample companies' betas,

[24] Raj Chetty and Emmanuel Saez (2004), Dividend Taxes and Corporate Behavior: Evidence from the 2003 Dividend Tax Cut, *National Bureau of Economic Research.*

[25] See, for example, Introduction on pg. 1.

[26] The Jobs and Growth Tax Relief Reconciliation Act of 2003 ("2003 Tax Act") was signed into law on May 23, 2003.

[27] Vilbert Direct at 16-20 and Appendix B.

and an estimate of the expected market risk premium. The Vilbert Direct uses data for September 2006[28] to estimate the risk-free rate so clearly any impact of the 2003 dividend tax cut would be reflected in that data. The Vilbert Direct obtained estimates of beta as of September 2006 for the sample companies from *Value Line Investment Survey*.[29] Since it is reasonable to believe that *Value Line* is well aware of the dividend tax policy, I see no reason to believe that the impact of this policy would be ignored in their estimation of forward looking betas. Finally, the Vilbert Direct estimates the market risk premium based on a variety of sources including very long realized risk premia. This historical period includes many different tax regimes. Because most of the data relied upon in the Vilbert Direct are from the period after the 2003 Tax Act, I believe that any impact of the dividend tax cut on the cost of equity is already fully reflected in the Vilbert Direct's cost of equity estimates.

Q22. Please discuss the likely effect of the 2003 Tax Act on the cost of capital.

A22. The 2003 Tax Act is likely to have reduced the cost of capital somewhat, but the effect is likely to be very small for a number of reasons.

Q23. Please elaborate on why the effect of the 2003 Tax Act is likely to be small.

A23. First, as noted in the Chetty and Saez paper, the number of companies paying dividends had declined and was less than 25 percent of all firms.[30] Even after the passage of the 2003 Tax Act, the percentage of firms paying dividends has increased only modestly. Second, there are alternative methods by which firms can payout money and avoid personal income taxes. For example, the Chetty and Saez paper mentions share repurchase as equivalent to paying a dividend, but share repurchase avoids the (former) higher tax rate on dividends.[31] Third, as noted by the Chetty and Saez paper,[32] many

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[28] Vilbert Direct, Workpaper #2 to Table No. MJV-9.

[29] August 24, 2006 for the Water Sample (Workpaper #1 to Table No. MJV-9) and September 15, 2006 for the Gas LDC Sample (Workpaper #1 to Table No. MJV-19).

[30] Chetty and Saez, op cit, pp. 5-6.

[31] *Ibid,* p. 5.

[32] *Ibid,* p. 3 and p. 23.

dividend paying stocks are held in tax exempt accounts such as IRAs or 401ks so the after-tax return to those investors is unaffected by the dividend tax cut. Taken together, these facts mean that the return to equity holders from taxable dividends is a relatively small portion of the total return to equity holders, and therefore, any change in tax policy on dividends is likely to have only a relatively small effect on the cost of capital.

Q24. Does the Chetty and Saez article support the Brown Testimony's conclusion that the 2003 Tax Act significantly reduced the cost of equity capital?

A24. No. This article does not support his conclusion, and this is the only article cited in the Brown Testimony in support of its argument that the 2003 Tax Act "[f]ederal policy increased the demand for the stock of dividend paying companies, and reduced those companies' cost of capital."[33] The Chetty and Saez article does not explicitly address the cost of capital let alone conclude that the cost of capital was reduced by the 2003 Tax Act. The article only finds that the number of firms paying dividends increased as did dividend payout ratios following the 2003 Tax Act. Moreover, the article is replete with references to the difficulty of determining the impact of the dividend tax cut on a number of variables of interest due to the "noisy" nature of the data,[34] just as noted in the Vilbert Direct.

V. CAPM ISSUES RAISED IN THE BROWN TESTIMONY

Q25. Do you have any general comments on the Brown Testimony's critique of the CAPM and its implementation of the model?

A25. Yes. The Brown Testimony's critique of the CAPM demonstrates confusion regarding the model and the theory underlying it. This confusion is also reflected in the Brown Testimony's implementation of the model. The areas of confusion are discussed below.

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[33] Brown Testimony at 25:7-10.

[34] See, for example, discussions on pages 12, 13, 34, and 37 of the Chetty and Saez working paper.

A. BETA ESTIMATES

Q26. What is the first area of confusion regarding the CAPM in the Brown Testimony?

A26. To see the problems with the Brown Testimony's understanding of the CAPM, it is useful to first review what the CAPM actually predicts. The CAPM says that a security's expected return is a function of its systematic risk (as measured by its beta) and the expected return on the market. Beta is defined as the covariance of a company's returns with the market's returns divided (i.e., scaled) by the variance of the market. Note in particular that the variability of a company's stock returns is not the same as its covariance with the market returns. The returns of some stocks (e.g. gold stocks) have very high volatility, but low covariance (i.e., a low beta) with the market.

The Brown Testimony mistakenly claims that the Vilbert response to Staff Data Request 1 (b) part (i) "contradicts the responses to (ii) and (iii) and reveals severe contradictions in his analysis."[35,36] In other words, the Brown Testimony does not seem to understand that the volatility of stock prices is not the same as the risk measured by beta which is the alleged contradiction on which the Brown Testimony seems to focus. If the Brown Testimony truly understood the CAPM, it would not conclude that the Vilbert responses to the cited data request were contradictory. Moreover, the Vilbert responses to the referenced data request are paraphrases of statements on the CAPM found in any graduate level textbook in corporate finance.[37] The second misunderstanding of the CAPM in this portion of the Brown Testimony is discussed next.

Q27. Based on the misunderstanding of the response to the data request, the Brown Testimony then claims that the Vilbert Direct adopts contradictory positions on comparability of sample companies.[38] In particular, the Brown Testimony reviews

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[35] Brown Testimony at 44: 19-21.

[36] The data request referenced is the Vilbert response to Staff Data Request 1 (b).

[37] For a more detailed discussion of the CAPM, see Chapters 7 and 8 of Brealey, Myers and Allen, *Principles of Corporate Finance, 8th Ed.*, McGraw-Hill/Irwin, 2006 and Chapter 10 of Ross, Westerfield and Jaffe, *Corporate Finance, 6th Ed.*, McGraw-Hill/Irwin, 2002.

[38] Brown Testimony at 43.

the *Value Line* estimated betas for the water utility and gas LDC samples and asks "how can a company with a beta of 0.85 be of comparable risk to a company with a beta of 0.45?" How do you respond?

A27. There is no reason to expect that companies within a particular industry will have identical beta estimates. Companies are considered to be of comparable risk if they have similar business risks, not because they have similar equity risk. Although two companies may have identical business risk, they may allocate these risks differently to their equity and debt holders through differences in capital structure and costs of debt. In other words, the expected return on equity is a function of *both* business risk and financial risk. The Brown Testimony makes no mention of financial risk whatsoever. The beta of a company's stock reflects the amount of underlying business risk and financial risk that is shouldered by equity holders. Therefore there is nothing unusual in two companies in the same industry having betas of 0.45 and 0.85. Such a divergence could reflect a difference in financial risk (i.e., capital structure), estimation error in one or both beta estimates, or slightly different business risk between the two companies or a combination of all of these factors.

In addition, the purpose of using a sample of proxy companies to estimate the cost of equity is to reduce estimation error. Cost of capital experts do not know the true beta of the industry so they select a sample of companies expected to be of comparable business risk. If the true beta for the water industry were know, it could be used to estimate the cost of equity without need of a sample. The Brown Testimony's criticism that the Vilbert Direct had many companies with betas between 0.45 and 0.85 from which to choose[39] assumes that the true water industry beta is known. Finally, although the Brown Testimony lists the Vilbert Direct's adjusted *Value Line* betas, it makes no mention of the fact that the Vilbert Direct uses the "unadjusted" values of the *Value Line* betas in estimating the cost of equity. The *Value Line* betas for the water sample average 0.73, but the unadjusted betas used in the Vilbert Direct average only 0.56.[40] This point

[39] Brown Testimony at 45.

[40] See Workpaper #1 to Table No. MJV-9.

is relevant given the Brown Testimony's assertion that *Value Line*'s betas are biased upward, an issue discussed in more detail below.

Q28. The Brown Testimony asserts that the Vilbert Direct "provided no explanation of how he narrowed the field to eight water companies and five gas companies."[41] Is this an accurate statement?

A28. No. This misstatement by the Brown Testimony is a complete mystery given that Section IV. A of the Vilbert Direct is labeled "Sample Selection", and the procedures and steps used to select both the water sample and the gas LDC sample are listed in great detail on pp. 23-27 and in Appendix B, pp. B-20 to B-29. Anyone reading the pages could easily follow the sample selection steps used in the Vilbert Direct and would know exactly why each company was eliminated from the universe of companies considered.

Q29. The Brown Testimony also expresses the opinion that the Vilbert Direct's gas LDC sample is not appropriate to estimate the cost of capital for a water utility company. How do you respond to the Brown Testimony's arguments?

A29. This is truly a matter of a difference of opinion. The Brown Testimony points out the differences in the gas LDC industry and the water industry, but it ignores the great similarity in the regulatory procedures governing both as well the comparability of the industries' infrastructure. In addition, the Brown Testimony ignores the data issues with the water sample companies that have the potential to affect the cost of capital estimates. The weaknesses of the water sample are enumerated in the Vilbert Direct on pp. B-21 and B-22. The Vilbert Direct uses the gas LDC sample estimates as a check on the results of the water sample. Not to at least check the validity of the results of the water sample when there are data issues known to affect the cost of capital estimates is unnecessarily incomplete when there is an easy alternative.

Q30. What beta estimates does the Brown Testimony use in its implementation of the CAPM?

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[41] Brown Testimony at 45: 10-13.

A30. The Brown Testimony uses betas from NASDAQ's internet site.[42] These betas include a beta estimate for York Water of 0. Recall that a beta of zero means that the asset has the same risk as a risk-free asset, i.e., a U.S. Treasury bill. It is doubtful that any reasonable observer would conclude that the stock of any water utility company is no more risky than a U.S. Treasury bill, but the Brown Testimony uses the zero beta estimate in its CAPM model and makes no comment whatsoever about the likely validity of such an estimate. In addition, the betas in the Brown Testimony range from 0 to 0.67, a much wider range than in the Vilbert Direct, but this range was not commented on either in the Brown Testimony.

Q31. The Brown Testimony claims that the "CAPM approach to equity returns is no longer accepted by the scholarly community"[43] and that the Vilbert Direct "ignores the evidence on the CAPM's debilities."[44] Is this an accurate assessment of either the CAPM or the Vilbert Direct?

A31. No. First, on p. B-16, the Vilbert Direct cites the same 2004 article by Fama and French referenced by the Brown Testimony. Professors Fama and French have published a series of papers[45] offering a substitute model that they claim better explains stock returns. The initial version of their model had three explanatory variables instead of one as does the CAPM, but one of the three is beta of the security measured against the market return as in the CAPM. In fact, that is precisely what the quotation from the Vilbert Direct at

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[42] Brown Testimony at 58.

[43] Brown Testimony at 50: 27:31.

[44] Brown Testimony at 51: 15-15.

[45] See for example, Eugene F. Fama and Kenneth R. French "Common Risk Factors in the Returns on Stocks and Bonds," *Journal of Financial Economics*, Vol. 33, 1993, pp., 3-56; Eugene F. Fama and Kenneth R. French "The Cross-Section of Expected Stock Returns," *Journal of Finance*, Vol. 47, June 1992, pp. 427-465; Eugene F. Fama and Kenneth R. French "Multifactor Explanations of Asset Pricing Anomalies," *Journal of Finance*, Vol. 51, March 1996, pp. 55-84; Eugene F. Fama and Kenneth R. French "The Value Premium and the CAPM," *Journal of Finance*, Vol. 61, October 2006, pp. 2163-2185; Eugene F. Fama and Kenneth R. French "Size and Book to Market Factors in Earnings and Returns," *Journal of Finance*, Vol. 50, March 1995, pp. 131-155; and Eugene F. Fama and Kenneth R. French "Characteristics, Covariances, and Average Returns: 1929-1997," *Journal of Finance*, Vol. 55, February 2000, pp. 389-406.

the top of p. 51 of the Brown Testimony is saying, "...beta remains alive and well as the best single measure of relative risk".[46]

Second, it is simply not accurate to say that the academic community no longer accepts the CAPM as the Brown Testimony asserts. The situation is more complicated than that. As noted in the Vilbert Direct, it has long been recognized that empirical tests of the CAPM have not been fully satisfactory, but there currently is no widely recognized or accepted theoretical alternative.[47] The Fama-French model, alluded to by the Brown Testimony, is an empirical model not a theoretical model. It was developed by testing several variables until a set was selected that seem to work, and because of this fact, the Fama-French model itself has been subjected to "data-mining" criticisms.[48] The Fama-French model is best viewed as an extension of the CAPM, not a complete rejection of the model.

Q32. The Brown Testimony conducts analysis of *Value Line's* beta estimates and claims that the analysis demonstrates that the *Value Line* betas used in the Vilbert Direct are biased upward and thus inflate the cost of capital estimates.[49] Do you agree that the Brown Testimony's analysis supports this conclusion?

A32. No. This is additional evidence of the Brown Testimony's misunderstanding of the CAPM as well as of basic forecast evaluation principles. Although the question as to whether or not *Value Line's* beta estimates are biased is relevant, the arguments expounded by the Brown Testimony to support this assertion are unsound.

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[46] Vilbert Direct at B16: 2-7.

[47] There is even doubt as to whether or not the CAPM can actually be tested, a sentiment now famously referred to as the Roll Critique (see "A Critique of the Asset Pricing Theory's Tests - Part I: On Past and Potential Testability of the Theory" by Richard Roll, 1977, Journal of Financial Economics, 4, pp. 129-176).

[48] Data mining refers to the effort to explain an observation by looking back in time at things that also happened and then claim that such an occurrence will predict the future. For example, the league that wins the World Series is associated with the party of the winning candidate in the next presidential election. There is no theory why the correlation of such events in the past should continue into the future because there is no causation (no theory) involved. This is simply data mining, i.e., finding two variables that are correlated without an explanation of why it should be so.

[49] Brown Testimony at 40-42.

Q33. Please explain why the Brown Testimony's analysis of *Value Line's* estimated betas is not evidence of bias.

A33. There are many problems with the assertion that a simple (i.e., arithmetic) average of *Value Line* betas greater than 1.0 implies that they are biased estimates, but I will focus only on the most relevant. First, the market portfolio in the CAPM is a market-value weighted-average portfolio of all stocks in the market. Since the beta of a portfolio is the market-value weighted-average of betas in the portfolio, the CAPM implies that the *market-value weighted-average* of true betas should be 1.0 (in theory), not that the simple average should equal 1.0. Therefore it is *not* inconsistent with the CAPM for a simple average of company betas in any portfolio to deviate from 1.0. *Value Line* covers 1700 of the literally thousands of stocks traded on the U.S. security exchanges.

Consider the simple example of a market with only two securities: A, B. Suppose security A has a market value of $200 and a beta of 1.3, while security B has a market value of $800 and a beta of 0.925. Then the market portfolio has a beta of one, computed as

$$\frac{200}{200+800}\times 1.3+\frac{800}{200+800}\times 0.925=1$$

But the simple average of betas is 1.1125:

$$\frac{1.3+0.925}{2}=1.1125$$

So even if one knew the true betas of all securities in the market and took their simple average, it is completely consistent with the CAPM for this average to deviate from 1.0. In fact, an average of exactly 1.0 would be expected to occur with zero probability. As such, the evidence presented in the Brown Testimony provides no evidence of a bias in *Value Line* betas.

A second problem with the Brown Testimony's analysis of bias is that the number of companies considered in the Brown Testimony's analysis (i.e. those companies for

which *Value Line* provides a beta forecast) does not include all of the companies in the New York Stock Exchange, much less the entire stock market. So even if all of *Value Line's* betas were estimated without error, and the market value weighted-average were calculated, there is nothing in the CAPM model that requires that such an average from a subset of securities should equal the market beta of one.

Finally, even if one conducted a valid analysis of the question as to whether *Value Line* betas are biased in general, the relevant question for this testimony is not if the whole universe of *Value Line* beta estimates is biased, but whether the estimates for the proxy group companies used in the Vilbert Direct are biased. Given the fact that forecasting betas faces less uncertainty in the well established utilities industries than in other market segments, it is unlikely that this would be the case. In any event, as noted by the above arguments, the Brown Testimony provides no evidence in either direction to address this issue.

B. The Estimated Market Risk Premium

Q34. The Brown Testimony alleges a number of problems with the Vilbert Direct's estimate of the Market Risk Premium used in the CAPM calculations. Moreover, he alleges that the use of an MRP of 6.5 percent exhibits a "strategy to overestimate returns and resist corrections."[50] Is this a fair statement?

A34. No. The Vilbert Direct attempts to provide a fair and broad representation of economists' perceptions of the market risk premium. There is no "strategy to overestimate return and resist corrections," nor does the Brown Testimony point out any errors in the Vilbert Direct unless differences of opinion constitute errors in the view of the Brown Testimony. The Vilbert Direct's survey of the academic literature shows that forecasts of the expected MRP today range widely compared to nearly universal agreement only a few years earlier that the historical realized MRP is the best estimate of the future MRP. Given this divergence of opinion, it is necessary to weigh all of the evidence to arrive at a reasonable estimate of the expected or forward looking MRP. The Vilbert Direct's

estimate of 6.5 percent (on an arithmetic mean basis) is an attempt to weigh the evidence and make a judgment. Moreover, the 6.5 percent estimates lies below the long-run historical arithmetic average MRP of 7.2 percent in the most recent edition of Ibbotson & Associates' yearbook.[51]

Q35. But the Brown Testimony presents evidence that Dr. Ibbotson himself believes in a lower MRP[52] and that this exposes huge differences between yourself and those of an expert on whom you rely. Is this accurate?

A35. No. First, the Brown Testimony may be confused by the difference between the MRP estimated on the basis of a geometric mean (compound mean) and one estimated on an arithmetic mean basis. Recall that a geometric mean return is the compound rate of return that relates two values in time as opposed to the arithmetic (i.e., simple) average of the returns per period. In a working paper by Professor Roger Ibbotson and Dr. Peng Chen in 2002, about the same time as the Ibbotson article referenced in the Brown Testimony, the authors estimate the market risk premium at six percentage points arithmetically but four percentage points geometrically.[53] The four percent geometric mean value is what is being quoted in the article reference in the Brown Direct on p. 23.[54] When quoting Dr. Ibbotson's article, the Brown Testimony seems to confuse the geometric mean estimate of four percent with an arithmetic estimate of the MRP. As is well known, the arithmetic mean MRP estimate is the appropriate value to use in the

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[50] Brown Testimony at 20-21.

[51] *SBBI: Valuation Edition 2006 Yearbook,* p. 189. The long-run MRP is 7.2 for the period 1945-2005 and 7.1 percent for the period 1926-2005.

[52] Brown Testimony at 21: 5-11.

[53] "Stock Market Returns in the Long Run: Participating in the Real Economy" by Roger Ibbotson and Peng Chen, dated July 9, 2002. This working paper was subsequently published as "Long-Run Stock Returns: Participating in the Real Economy", in *Financial Analysts Journal*, January/February 2003, pp. 88-98, and is referenced in Appendix B of the Vilbert Direct. The working-paper version of the article is freely available to the public from Morningstar Inc. which wholly owns Ibbotson Associates. http://corporate.morningstar.com

[54] The second Ibbotson article referenced in the Brown Testimony does not discuss the MRP at all – it only considers a forecast of the long-run market return. However, it is not clear in article whether the market return being discussed is on a geometric or arithmetic basis.

CAPM.[55] The Vilbert Direct uses an estimate of 6.5 percent on an arithmetic basis which is not substantially different that the Ibbotson and Chen estimate of 6 percent.

Q36. The Brown Direct paraphrases your opinion on estimating the MRP as "there is no consensus, so one opinion is as good as another."[56] Is this an accurate assessment of your opinion regarding the state of academic research into the MRP?

A36. No. Once again, it is difficult to understand how the Brown Testimony concluded that the Vilbert Direct embodies such an opinion. The Vilbert Direct reviews the academic literature in pp. B-4 to B-12 and attempts to illustrate the full range of opinion on the MRP. Nowhere does the Vilbert Direct state or imply that one opinion is as good as another. Moreover, the Vilbert Direct evaluates the various strands of the academic argument on the MRP and arrives at a very definite opinion that is supported by the academic articles reviewed.

Q37. Do you have any final comments on the Brown Testimony's implementation of the CAPM?

A37. Yes. The Brown Testimony estimates a return on equity for the companies in the water sample of 6.3 percent. This is only 20 basis points greater than the current yield on BBB rated utility debt, but this fact does not even warrant a comment in the Brown Testimony. This outcome is the result of the following questionable assumptions inherent in the Brown Testimony's implementation of the model: a beta that includes an estimate of 0.0 in the average beta for the sample, a market risk premium of 3.5 percent and no consideration of financial risk differences among the sample companies. Moreover, the Brown Testimony's implementation of the CAPM relies upon a forecast of the market

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[55] See for example, Brealey, Myers and Allen, *Principles of Corporate Finance, 8th Ed.*, McGraw-Hill/Irwin, 2006, pp. 150-151, and Bodie, Kane and Marcus, *Investments, 6th Ed.*, McGraw-Hill/Irwin, 2005, pp. 864-865. See also *SBBI: Valuation Edition 2006 Yearbook*, p. 77.

[56] Brown Testimony at 51: 33-35.

return for 2007, a practice specifically warned against in the speech by John C. Bogle in the article cited in the Brown Testimony.[57]

Q38. Why is it inappropriate to implement the CAPM with reference to a forecast of the expected return on the market?

A38. First, as noted by Mr. Bogle, forecasts of expected market returns are so difficult and the actual outcomes so variable that relying upon such a forecast is highly questionable. It is no more correct to rely on a very high or very low forecast than it is an average forecast because the forecasts are so frequently and substantially wrong. The correct method is to implement the CAPM is to add an estimate of the MRP to a forecast interest rate. This procedure adjusts the expected market return as the risk-free interest rate changes. A method that relies upon forecasts of the market return and a current interest rate results in a changing MRP as interest rates change. For example, the Brown Testimony ends up with a 3.5 percent MRP for the CAPM from this approach, a value which is lower than even the geometric MRP reference in the Ibbotson article.

VI. DCF ISSUES

Q39. The Brown Testimony raises a number of concerns relating to the Vilbert Direct's DCF estimates of the costs of equity. What is your initial reaction to these criticisms?

A39. There are a number of incorrect or misleading statements in the Brown Testimony's criticisms of the Vilbert Direct's DCF estimates, but my initial reaction is that the Brown Testimony's whole line of criticism is largely irrelevant. As the Brown Testimony itself acknowledges,[58] the Vilbert Direct does not rely very heavily on the DCF estimates in arriving at the recommended cost of equity for Tennessee-American. The reasons the Vilbert Direct does not rely on the DCF method are different from issues raised in the Brown Testimony, but both focus on the difficulty with estimating the dividend growth

[57] See "What's Ahead for Stocks and Bonds – And How to Earn Your Fair Share," Keynote Speech by John C. Bogle, "The Money Show", Las Vegas, NV, May 15, 2006.

rates for use in the model. Arriving at accurate growth estimates is particularly difficult when an industry is in flux as is the water industry due to the changing environmental standards and the requirement to replace aging infrastructure.

Q40. Are there any other potential problems with the DCF model?

A40. Yes, as with the CAPM, the DCF model has also been subject to criticism in the academic community. As noted on p. C-4 of the Vilbert Direct, the DCF model has been called into question by a branch of the academic literature on the volatility of stock prices compared to the volatility of forecast dividends[59] as well as other questions about the applicability of the model also discussed in Appendix C of the Vilbert Direct. The Brown Direct does not mention this branch of the academic literature on the estimation models when arriving at its conclusion that the DCF model is preferable to the CAPM.

Q41. If the Vilbert Direct recommends viewing the DCF estimates with caution, why would you primarily rely on DCF estimates in testimony concerning Mystic Development LLC's cost of capital, as alleged in the Brown Testimony?[60]

A41. This is a further example of the Brown Testimony's selective and misleading use of facts. The Vilbert Mystic Development Testimony was filed before the Federal Energy Regulatory Commission ("FERC"), which has repeatedly expressed a preference for a very specific implementation of the DCF model. Dr. Brown has not testified before the FERC so perhaps he is unfamiliar with that regulatory body's filing requirements.[61] Any cost of capital testimony before the FERC should present DCF estimates that conform to

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[58] Brown Testimony at 35: 1-9.

[59] See for example, Robert J. Shiller (1981), "Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?" *The American Economic Review*, Vol. 71, No. 3, pp. 421-436. John Y. Campbell and Robert J. Shiller (1988), "The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors," *The Review of Financial Studies*, Vol. 1, No. 3, pp. 195-228. Lucy F. Ackert and Brian F. Smith (1993), "Stock Price Volatility, Ordinary Dividends, and Other Cash Flows to Shareholders," *Journal of Finance*, Vol. 48, No. 1, pp. 1147-1160. Eugene F. Fama and Kenneth R. French (2001), "Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay?" *Journal of Financial Economics*, Vol. 60, pp. 3-43. Borja Larrain and Motohiro Yogo (2005), "Does Firm Value Move Too Much to be Justified by Subsequent Changes in Cash Flow?" Federal Reserve Bank of Boston, *Working Paper*, No. 05-18.

[60] Brown Testimony at 37: 3-11 and 35-37.

[61] See response to Discovery Request No. 23, part a).

the FERC's method as a point of comparison and benchmark for the Commission or risk rejection. However, far from relying on the DCF estimates derived from the FERC DCF method, the Vilbert Testimony in the Mystic proceeding relied upon the risk positioning methodology as clearly revealed in the Brown Testimony's own selective citation on pg. 37. In line 9 of the extracted testimony, the Vilbert Testimony explicitly states "The *Commission's* preferred sample selection and estimation methods differ from my usual procedures." (Emphasis added). The citation goes on to state:

> While I rely on the Commission's preferred DCF estimation method for the Commission-Based Electric and LICAP samples, I estimate the cost of capital using procedures and methods that differ somewhat from the Commission's DCF procedures for the Baseline Electric sample. For this sample, I estimate the cost of equity using both the DCF method and the Risk Positioning model.

The FERC DCF estimates were presented in the Vilbert Mystic Testimony to provide a calculation that the FERC prefers to see as part of any testimony it considers. As mentioned in the quotation, the Vilbert Mystic Testimony augmented the FERC DCF estimates with analysis analogous to that in the Vilbert Direct in this proceeding. Indeed, a complete reading of the Vilbert Mystic Testimony reveals the same sentiments towards the DCF methodology that the Vilbert Direct has presented in the current filing. Since that testimony is a matter of public record, I will not dwell further on this point except to cite a subsequent passage found on pg. 61 of the Vilbert Mystic Testimony (FERC Docket No. ER06-427-003):

> In short, the unavoidable questions about the DCF model's strong assumptions cause me to view the DCF method as *inherently* less reliable than the risk positioning approach described above. However, the DCF method is widely used, and I understand that it is the Commission's preferred method. I submit DCF evidence in this case using the Commission's preferred DCF approach as well as the multistage and single-stage DCF models, but the DCF estimates must all be considered with care given the industry conditions noted above.

Q42. In spite of the questionable relevance of this line of criticism in the Brown Testimony, please address some of the concerns it raises about the Vilbert Direct's

DCF estimates. How do you respond to the Brown Testimony's claim that "'What actually happened' has not the slightest impact on . . ."[62] your DCF estimates?

A42. Putting aside for the moment the claim that "security analysts have been corrupted in the past by the pressures brought against them,"[63] the Brown Testimony appears to suggest that because the Vilbert Direct DCF estimates use security analysts' growth rate forecasts, it ignores historical growth information and the impact of the 2003 dividend tax reduction. Following this logic one step further, one would be forced to conclude that security analysts forecast in a vacuum and ignore both historical growth rates and current economic conditions (including the current dividend tax policy) when formulating their expectations.

This is not credible. First, as noted above, whatever effect the 2003 dividend tax cut has had on the cost of capital, it is already reflected in the market information used to estimate the sample companies' cost of capital. Second, the whole point of using analyst forecasts is that they have larger information sets available to them than available to the general public, and they have specialized knowledge and experience to better interpret that information. Specifically, the analysts' forecasts will generally embody historical growth information in addition to an abundance of further information which helps predict future growth rates. As such, the analysts' forecasts would themselves incorporate historical growth rates and the impact of the dividend tax credit (if any) on the sample companies. Indeed, by using only historical growth rates, the Brown Testimony ignores a potentially large and important set of forecasting information. The superiority of analyst forecasts to historical growth rates as predictors of future earnings has been documented repeatedly.[64]

Third, this raises a further concern with the Brown Testimony's reliance on growth rates derived solely from historical dividend growth rates. Even if one were to

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[62] Brown Testimony at 31: 17-18.

[63] Brown Testimony at 31: 25-27.

[64] For additional discussion on this issue, see Chapter 9 in *New Regulatory Finance*, by Roger A. Morin, Public Utilities Reports, Inc., Vienna, Virginia, 2006.

accept the view that analyst forecasts are poor according to some standard, the relevant question here is whether analysts' forecasts perform better than forecasts utilizing only historical growth rates. It is irrelevant whether or not there exists some yet to be discovered hypothetical forecasting rule that could do better than analysts' forecasts. In CAPD's response to the Company's Discovery Request No. 21, it is suggested that an article by Professors Fama and French in 2002 supports the superiority of historical dividend growth rates over the use of analysts' forecasts of growth rates in the DCF model. Specifically, the following extract from this article is provided (although mis-cited as p.651 when it is in fact on page 650):

> We are interested in post-2000 expected dividend growth... Our evidence that dividend growth is essentially unpredictable during the last 50 years confirms the results in Campbell (1991), Cochrane (1991, 1994), and Campbell and Shiller (1998). If dividend growth is unpredictable, the historical average growth rate is the best forecast of future growth.

What is not explained in the Brown Testimony is the context of this statement. The paper's actual result is that when one tries to forecast growth rates beyond one year into the future, historical growth rates and market returns have limited explanatory power in the context of an estimated regression model limited to the history of these variables. As such, the historical average growth is better than any based upon a regression model using only historical growth rates and market returns. This in no way suggests, and it is never claimed or suggested by the authors that forecasts based upon expanded information are inferior to forecasts based on average historical growth rates. As discussed in Appendix C of the Vilbert Direct, the evidence has strongly supported the superiority of analyst forecasts in general over forecasts based solely on historical data. Although how these two approaches perform in respect of the specific sample companies utilized in these testimonies is not precisely examined, I have no reason to believe that the pattern is any different for the sample companies. The Brown Testimony certainly provides no evidence with respect to this question. Indeed, the conclusion one would be more inclined to draw from the referenced article is that the Brown Testimony's use of average growth rates over only three or four years of historical data is a poor practice,

contrary to the academic literature on the topic and casts serious doubts as to the validity of its recommendations.

Q43. What about the claim in the Brown Testimony that analysts' forecasts are biased upward as a result of "pressures brought against them"?

A43. First, as the Brown Testimony notes, reforms were taken to curb abuse.[65] The conclusion from the Joint Report by NASD and the NYSE, cited in the Brown Testimony, on the reforms states

> ... the SRO Rules have been effective in helping restore integrity to research by minimizing the influences of investment banking and promoting transparency of other potential conflicts of interest. Evidence also suggests that investors are benefiting from more balanced and accurate research to aid their investment decisions.[66]

As the Brown Testimony noted, the report does note additional reforms are advisable, but the situation is far different than during the height of the tech bubble when analyst objectivity was clearly suspect.

Q44. Has evidence been presented that analysts forecast for regulated utilities have suffered from optimism bias?

A44. Certainly not to the extent that was true for the technology stocks during the tech bubble. The Vilbert Direct provides evidence on this issue on pp. C-6 to C-8 and references an article[67] that discusses analyst optimism bias on companies sorted by the size of the IBES forecast. Utilities constitute 25 percent of all companies in the lowest quintile of forecasts, and whether that quintile has any bias at all is debatable. Moreover, the reforms discussed above are likely to have further reduced whatever bias may be present at the time because the sample of IBES forecasts in the article was for a period prior to the reforms.

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[65] Brown Testimony at 32: 30-34.

[66] Joint Report by NASD and NYSE on the Operation and Effectiveness of the Research Analyst Conflict of Interest Rules, December 2005, p. 44, which was included with the Brown Testimony.

So, none of the statements in the Brown Testimony constitutes evidence, in my opinion, that the analysts' forecasts of the water utility sample companies or the gas LDC sample companies (which constitute the Vilbert Direct's samples) are inferior to forecasts based on historical growth rates alone. As stated above, this is the relevant question for this testimony. Furthermore, the general finding is one of superiority of analysts' forecasts compared to those based upon historical data alone, so even if one agrees that certain conflicts of interest have exerted a negative influence on the accuracy of analyst forecasts, as detrimental as this may be, it appears to be less destructive than simply ignoring all other information and relying solely on historical growth rates. Ironically, taken in context of other research in the field, the Brown Testimony actually documents that basing forecasts solely on historical growth rates may be an exceedingly poor practice.

VII. CONCLUSIONS

Q45. What are your conclusions regarding the Brown Testimony?

A45. As noted above, the Brown Testimony's recommendations for the rate of return on equity and capital structure are unlikely to meet the standards established by the Supreme Court in the *Hope Natural Gas* and the *Bluefield Waterworks* cases. Specifically, a utility must be allowed a fair opportunity to earn a rate of return commensurate with that earned on comparable risk investments, maintain its financial integrity and attract capital. The 7.5 percent rate of return on equity recommended in the Brown Testimony is simply not comparable to that of other water utilities or generic utilities, nor is the capital structure comparable. It is highly unlikely that Tennessee-American, on a stand-alone basis, would be able to attract the capital it needs for infrastructure investments and environmental upgrades if it were allowed a return on equity of only 7.5 percent on a capital structure which effectively has only 25.6 percent equity.

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[67] K.C. Chan, J. Karceski, and J. Lakonishok, 2003, "The Level and Persistence of Growth Rates," *Journal of Finance* 58(2):643-684.

In addition, as demonstrated above, the Brown Testimony's assertions of errors in the Vilbert Direct and of a strategy to overestimate the Company's cost of capital are without foundation. In fact, it is the Brown Testimony that demonstrates a misunderstanding of the theory and practice of the CAPM with factually inaccurate statements and references. The Brown Testimony does not even consider differences in financial risk between the sample companies and the recommended capital structure for Tennessee-American. Finally, the Brown Testimony's reliance solely on historical data to estimate expected growth rates for use in the DCF model destroys one of the primary virtues of the DCF model, i.e., that is it a forward-looking model.

TENNESSEE REGULATORY AUTHORITY

COMMONWEALTH OF MASSACHUSETTS

COUNTY OF MIDDLESEX

BEFORE ME, the undersigned authority, duly commissioned and qualified in and for the State and County aforesaid, personally came and appeared Michael J. Vilbert, being by me first duly sworn deposed and said that:

He is appearing as a witness on behalf of Tennessee-American Water Company before the Tennessee Regulatory Authority, and if present before the Authority and duly sworn, his rebuttal testimony would set forth in the annexed transcript consisting of 33 pages.

Michael J. Vilbert

Michael J. Vilbert

Sworn to and subscribed before me
this 9th day of April 2007.

Notary Public

My commission expires Nov. 15, 2007.

MARJORIE J. FISCHER
Notary Public
Commonwealth of Massachusetts
My Commission Expires Nov 15, 2007

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has been served via the method(s) indicated, on this the 9th day of April, 2007, upon the following:

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