COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF AN ADJUSTMENT OF GAS RATES OF THE UNION LIGHT, HEAT AND POWER COMPANY	)))	CASE NO. 2005-00042

REBUTTAL TESTIMONY OF

ROGER A. MORIN

ON BEHALF OF

THE UNION LIGHT, HEAT AND POWER COMPANY

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, ADDRESS, AND OCCUPATION.

A. My name is Dr. Roger A. Morin. My business address is Georgia State University, Robinson College of Business, University Plaza, Atlanta, Georgia, 30303. I am Professor of Finance at the College of Business, Georgia State University, and Professor of Finance for Regulated Industry at the Center for the Study of Regulated Industry at Georgia State University. I am also a principal in Utility Research International, an enterprise engaged in regulatory finance and economics consulting to business and government.

Q. ARE YOU THE SAME DR. MORIN WHO PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?

A. Yes.

Q. PLEASE DESCRIBE THE PURPOSE OF YOUR REBUTTAL TESTIMONY.

A. I have been asked to provide testimony in rebuttal to Dr. Randall Woolridge's rate of return testimony filed on behalf of the Kentucky Office of Attorney General ("OAG").

Q. PLEASE SUMMARIZE DR. WOOLRIDGE'S RATE OF RETURN RECOMMENDATION.

A. Dr. Woolridge recommends a common equity return ("ROE") allowance of only 8.7%. In determining the cost of equity, Dr. Woolridge applies a Discounted Cash Flow ("DCF") analysis to a group of 11 natural gas distribution utilities. This study, summarized on Page 25 of his testimony, produces a result of 8.69%.

Dr. Woolridge also performs a Capital Asset Pricing Model ("CAPM") analysis, although he does not rely on the results of this analysis in spite of devoting more than one half of his testimony to the CAPM and its proper inputs. The CAPM analysis, summarized on Page 41 of his testimony, produces a result of 7.9%, barely above the Company's cost of debt. From his sole DCF analysis, Dr. Woolridge concludes that The Union Light, Heat & Power Company's ("ULH&P" or "Company") cost of equity is only 8.7%.

Q. WHAT IS YOUR GENERAL REACTION TO DR. WOOLRIDGE'S COST OF COMMON EQUITY RECOMMENDATION?

A. My general reaction to his draconian recommendation, before I engage in a more technical critique, is that there are two major infirmities in Dr. Woolridge's testimony. First, I find that Dr. Woolridge's recommended 8.7% ROE for ULH&P lies completely outside the zone of reasonableness and well outside the zone of currently authorized rates of return for major natural gas and electric utilities in the United States, and, as such, is very difficult to take seriously. Dr. Woolridge's recommended drastic reduction in the Company's ROE down to only 8.7%, if ever adopted, would result in the lowest rate of return award for a major natural gas distribution or electric utility in the country. I hesitate to think of its adverse consequences on the Company's credit ratings, financial integrity, the stock of its parent company, the company's capital raising ability, and ratepayers. Moreover, Dr. Woolridge's single-digit recommended ROE lies well outside the zone of his own comparable companies' authorized ROEs. These are clear indications that his return on equity recommendation for ULH&P is far too low.

The second major structural flaw of Dr. Woolridge's testimony is that his recommendation of 8.7% rests exclusively on the questionable results of a DCF model. Unfortunately, Dr. Woolridge has put all of his eggs in the fragile DCF basket which causes him to recommend returns that are well below investors' required returns. Moreover, his CAPM analysis is flawed, as I discuss later.

Q. WHAT ARE THE BASIC CONCLUSIONS OF YOUR REBUTTAL TO DR. WOOLRIDGE'S COST OF EQUITY TESTIMONY?

A. Dr. Woolridge seriously understates ULH&P's cost of common equity. A proper application of cost of capital methodologies would give results substantially higher than those that he obtained. Dr. Woolridge's overall testimony structure, which places exclusive reliance on the DCF approach, is outside the mainstream of both financial theory and practice.

Q. PLEASE SUMMARIZE YOUR SPECIFIC CRITICISMS OF DR. WOOLRIDGE'S TESTIMONY.

A. I have sixteen specific criticisms:

1. Return Recommendation Far Out of The Mainstream. Dr. Woolridge's recommended return is completely outside the zone of currently allowed rates of return for major natural gas and electric utilities in the United States and for his own sample of companies. The average allowed return on equity for gas utilities in the years 2002 and 2003 was 11% for both years and is 10.6% for 2004, and 10.7% for the first quarter of 2005. These authorized returns exceed by a significant margin Dr. Woolridge's anemic 8.7% recommended return for ULH&P. Also, the currently authorized ROE for Dr. Woolridge's own

comparable companies averaging 11.1% is also much higher than his recommended ROE for ULH&P.

2. The DCF Model Understates the Cost of Equity. It is well-known that application of the DCF model to utility stocks understates the investor's expected return when the Market-to-Book ("M/B") ratio exceeds unity. This is particularly relevant in the current capital market environment where utility stocks, including Dr. Woolridge's sample companies, are trading at M/B ratios well above unity.

3. Understated Dividend Yield. Dr. Woolridge's dividend yield component is understated because it is not consistent with the annual form of the DCF model. It is inappropriate to increase the dividend yield by adding one-half the future growth rate to the spot dividend yield. The appropriate manner of computing the expected dividend yield when using the plain vanilla annual DCF model is to add the full growth rate rather than one-half the growth rate. This error understates the DCF results by some 15 basis points.

4. The Use of an Average Five-Month Stock Price in the DCF Model. Dr. Woolridge's application of the DCF model violates market efficiency principles and mismatches stock price and expected growth.

5. DCF Dividend Yield and Flotation Costs. Dr. Woolridge's dividend yield component is understated by 30 basis points because it does not allow for flotation costs, and, as a result, a legitimate expense is left unrecovered.

6. DCF Historical Growth Rates. In order to estimate the growth component of the DCF model, Dr. Woolridge relies in part on historical growth despite substantial changes occurring in the energy utility industry. Moreover,

historical growth rates are somewhat redundant since historical growth patterns are already reflected in analysts' growth forecasts, which he also uses. Also, the stock price Dr. Woolridge uses in his DCF analysis is predicated on analysts' growth forecasts and not on historical growth rates.

7. DCF Dividend Growth Rates. For estimating the growth component of the DCF model, Dr. Woolridge also examines historical and projected dividend growth in his DCF analysis even though energy utilities are reducing dividend payouts. Because energy utilities are expected to lower their dividend payout ratio over the next several years in response to heightened business risk, the use of dividend growth projections is inappropriate in the DCF model. Earnings growth projections are far more relevant at this point.

8. Internal Growth Method. There are logical inconsistencies in the internal growth technique employed by Dr. Woolridge. The internal growth approach for estimating the growth component in the DCF formula is invalid because it is logically inconsistent. The basic flaw is that Dr. Woolridge uses a required ROE in his calculations that is different from the required ROE he recommends that the Commission adopt. From Dr. Woolridge's own evidence, investors expect substantially higher returns for utilities than what Dr. Woolridge recommends.

9. Analysts' Growth Forecasts. The best proxy for the growth component of the DCF model is analysts' long-term earnings growth forecasts. Investors expect substantially higher long-term growth rates for gas utilities than what Dr. Woolridge employs in his DCF analysis.

10. Market-to-Book ratios are Largely Irrelevant. Dr. Woolridge's views on the role of M/B in regulation are draconian, illogical, and inconsistent.

11. CAPM Risk-Free Rate. Dr. Woolridge's CAPM results are improper because, among other reasons, his proxy for the risk-free rate is inappropriate. The correct proxy for the risk-free rate in the CAPM is the yield on 30-year Treasury bonds.

12. CAPM Beta Estimates. There is an inconsistency in Dr. Woolridge's choice of beta estimate in the CAPM analysis. He reports 0.65 in one portion of his testimony but chooses an estimate of 0.76 in implementing the CAPM.

13. CAPM Market Risk Premium. Dr. Woolridge's estimate of the market risk premium is far too low because: 1) he has erroneously employed geometric means instead of the correct arithmetic means and because of his arbitrary choice of the literature on which he relies; 2) he has misrepresented the literature on the subject; and 3) there is a serious logical contradiction on Dr. Woolridge's rate of return recommendation. Use of the correct market risk premium increases Dr. Woolridge's CAPM estimate of ULH&P's cost of equity by 120 basis points.

14. CAPM and the Empirical CAPM (ECAPM). The plain vanilla version of the CAPM used by Dr. Woolridge understates the Company's cost of equity for low-beta securities.

15. Higher Projected Long-term Interest Rates. Dr. Woolridge's recommended ROE is not reflective of the forecast increase in capital costs.

16. Unfounded criticisms. Dr. Woolridge's criticisms of my testimony are unfounded.

I shall now discuss each criticism in turn.

II. ALLOWED RETURNS

Q. IS DR. WOOLRIDGE'S RATE OF RETURN RECOMMENDATION COMPATIBLE WITH CURRENTLY ALLOWED RETURNS IN THE NATURAL GAS UTILITY INDUSTRY?

A. No, it is not. Allowed returns, while certainly not a precise indication of a company's cost of equity capital, are nevertheless important determinants of investor growth perceptions and investor expected returns. They also serve to provide some perspective on the validity and reasonableness of Dr. Woolridge's recommendation.

The average allowed return in the natural gas utility industry in the years 2002, 2003, 2004, and 2005 as reported by Regulatory Research Associates in its most recent survey of regulatory decisions dated April 6, 2005 was 11.0%, 11.0%, 10.6%, and 10.7%, respectively. For the first quarter of 2005, the average allowed ROE is 10.7%. These ROE awards exceed by a substantial margin Dr. Woolridge's recommended single-digit ROE of only 8.7% for ULH&P.

I have also examined the range of returns currently allowed on common equity for the eleven natural gas utilities in Dr. Woolridge's comparable group as reported in AUS Utility Reports survey for June 2005. The currently authorized ROEs for Dr. Woolridge's sample, shown in Table 1 below, average 10.9%:

TABLE 1 - AUTHORIZED RETURNS

Company	Allowed ROE
AGL Resources	10.7%
Atmos Energy Corp.	11.9%
Cascade Natural Gas Corp.	11.8%

Keyspan Corp.	10.2%
Laclede Group, Inc.	
NICOR, Inc.	
Northwest Natural Gas Co.	10.2%
Peoples Energy Corp.	11.2%
Piedmont Natural Gas, Inc.	11.3%
South Jersey Industries, Inc	10.0%
WGL Holdings, Inc	10.6%
AVERAGE:	**10.9%**

Source: AUS Utility Reports 6/2005

In short, Dr. Woolridge's recommendation is well outside the mainstream of the allowed rates of return that were current during the period in which Dr. Woolridge performed his analysis and lies outside the zone of recently authorized returns for natural gas utilities and for his own sample of companies.

Unreasonable rate treatment for a Kentucky utility, if implemented, may have serious public policy implications and repercussions for the Commonwealth of Kentucky which are not mentioned in Dr. Woolridge's testimony. For example, the quality of regulation and the reasonableness of rate of return awards clearly have implications for regulatory climate, economic development and job creation in a given territory. The consistency of regulation in a given state has similar implications. It is my belief that Dr. Woolridge's recommended return has negative implications on these grounds and is not consistent with the economic well-being of the Commonwealth.

II. DCF MODEL UNDERSTATES THE COST OF EQUITY

Q. DOES DR. WOOLRIDGE'S DCF RESULT UNDERSTATE THE COST OF EQUITY?

A. Yes, it does, and so does my own DCF results for that matter. Application of the DCF model produces estimates of common equity cost that are consistent with

investors' expected return only when stock price and book value are reasonably similar, that is, when the M/B ratio is close to unity. As shown below, application of the standard DCF model to utility stocks understates the investor's expected return when the M/B ratio of a given stock exceeds unity. This is particularly relevant in the current capital market environment where utility stocks are trading at M/B ratios well above unity and have been for two decades. The converse is also true, that is, the DCF model overstates the investor's return when the stock's M/B ratio is less than unity. The reason for the distortion is that the DCF market return is applied to a book value rate base by the regulator, that is, a utility's earnings are limited to earnings on a book value rate base.

Q. CAN YOU ILLUSTRATE THE EFFECT OF THE MARKET-TO-BOOK RATIO ON THE DCF MODEL BY MEANS OF A SIMPLE EXAMPLE?

A. Yes. The numerical illustration shown in Table 2 below demonstrates the result of applying a market value cost rate to book value rate base under three different M/B scenarios. The three columns correspond to three M/B situations: the stock trades below, equal to, and above book value, respectively. The last situation (shaded portion of the table) is noteworthy and representative of the current capital market environment. The DCF cost rate of 10%, made up of a 5% dividend yield and a 5% growth rate, is applied to the book value rate base of $50 to produce $5.00 of earnings. Of the $5.00 of earnings, the full $5.00 are required for dividends to produce a dividend yield of 5% on a stock price of $100.00, and no dollars are available for growth. The investor's return is therefore only 5% versus his required return of 10%. A DCF cost rate of 10%, which implies $10.00

of earnings, translates to only $5.00 of earnings on book value, a 5% return.

The situation is reversed in the first column when the stock trades below book value. The $5.00 of earnings are more than enough to satisfy the investor's dividend requirements of $1.25, leaving $3.75 for growth, for a total return of 20%. This is because the DCF cost rate is applied to a book value rate base well above the market price.

Therefore, the DCF cost rate understates the investor's required return when stock prices are well above book, as is the case presently, and Dr. Woolridge's DCF results, the crux of his recommended ROE, understate ULH&P's cost of common equity capital.

TABLE 2 - EFFECT OF MARKET-TO-BOOK RATIO ON MARKET RETURN

	Situation 1	*Situation 2*	*Situation 3*
1 Initial purchase price	$25.00	$50.00	$100.00
2 Initial book value	$50.00	$50.00	$50.00
3 **Initial M/B**	**0.50**	**1.00**	**2.00**
4 **DCF Return 10% = 5% + 5%**	**10.00%**	**10.00%**	**10.00%**
5 Dollar Return	$5.00	$5.00	$5.00
6 Dollar Dividends 5% Yield	$1.25	$2.50	$5.00
7 Dollar Growth 5% Growth	$3.75	$2.50	$0.00
8 **Market Return**	**20.00%**	**10.00%**	**5.00%**

Many of the assumptions that must be made to utilize the DCF model are simply not realistic, including that of a constant M/B. According to the theory of the constant growth form of the DCF, future earnings per share, dividends per share, book value per share, and price per share will all grow at the same constant rate. There is no evidence that these conditions actually prevail in the equity market. Indeed, a casual examination of Dr. Woolridge's Schedule 7.3 clearly

demonstrates that these steady-state growth conditions represent unrealistic assumptions. The constant growth assumptions of the DCF do not track reality.

Q. DR. MORIN, CAN THE DISTORTION INHERENT IN THE DCF MODEL BE QUANTIFIED?

A. Yes, it can. The allowed return on book equity can be revised to account for any sanctioned difference between market price and book value. The adjustment to the market-based DCF cost of equity capital can be obtained from the following formula developed from the DCF formula:[1]

$$\text{Return on Book Equity} = \frac{\text{M/B Ratio x DCF cost of equity}}{1 + [\text{retention rate (M/B} - 1.0)]}$$

Using Dr. Woolridge's own input data, that is, for a market/book ratio of 1.7, a dividend payout ratio of 60% and a DCF market-based cost of equity of 8.7%, the indicated ROE is:

$$\text{ROE} = \frac{1.7 \times 8.7\%}{1 + [.40\ (1.7 - 1.0)]}$$

$$\text{ROE} = 11.7\%$$

The difference between the ROE and the DCF market-based cost of equity of approximately 300 basis points is the understatement.

Q. DO REGULATORS SHARE YOUR RESERVATIONS ON THE RELIABILITY OF THE DCF MODEL?

A. Yes, I believe they do. My sentiments on the DCF model were echoed in a decision by the Indiana Utility Regulatory Commission ("IURC"). The IURC

[1] See Morin, *Regulatory Finance*, Public Utility Reports Inc., Arlington, VA., Chapter 10 page 252 for the derivation of this adjustment formula.

recognized its concerns with the DCF model and that the model understates the cost of equity. In Cause No. 39871 Final Order, the IURC states on page 24:

> ....the DCF model, heavily relied upon by the Public, understates the cost of common equity. The Commission has recognized this fact before. In Indiana Mich. Power Co. (IURC 8/24/90), CauseNo. 38728, 116 PUR4th 1, 17-18, we found:
>
> [T]he unadjusted DCF result is almost always well below what any informed financial analyst would regard as defensible, and therefore requires an upward adjustment based largely on the expert witness's judgment.

The Commission also expressed its concern with a witness relying solely on one methodology:

> .....the Commission has had concerns in our past orders with a witness relying solely on one methodology in reaching an opinion on a proper return on equity figure.
> (page 25)

Q. IS THE INDIANA COMMISSION UNIQUE IN THAT REGARD?

A. No, it is not. A vast majority of regulatory commissions do not rely **solely** on the DCF in setting the allowed rate of return on common equity. Instead, they utilize a variety of methods, as evidenced by the results posted in a survey conducted by the National Association of Regulatory Utility Commissioners ("NARUC").

III. UNDERSTATED DIVIDEND YIELD

Q. DO YOU HAVE ANY COMMENT ON DR. WOOLRIDGE'S DIVIDEND YIELD COMPONENT IN THE DCF ANALYSIS?

A. Yes. I disagree with Dr. Woolridge's dividend yield calculation in his DCF analysis (Schedule JRW-7 page 1) because he multiplied the spot dividend yield by one plus one half the expected growth rate (1 + 0.5g) rather than by one plus the expected growth rate (1 + g). This procedure understates the return expected

by the investor.

The fundamental assumption of the annual DCF model used by Dr. Woolridge is that dividends are received annually at the end of each year and that the first dividend is to be received one year from now. Instead, Dr. Woolridge calculates the first dividend by multiplying the current dividend by only one plus one-half the growth rate instead of multiplying by one plus the growth rate. Since the appropriate dividend to use in a DCF model is the prospective dividend one year from now rather than the dividend one-half year from now, Dr. Woolridge's approach understates the proper dividend yield. This creates a downward bias in his dividend yield component, and underestimates the cost of equity by approximately 10 basis points. For example, for a spot dividend yield of 5% and a growth rate of 5%, the correct expected dividend yield is 5% times (1 + 0.05), which equals 5.25%, and not 5% times (1 + 0.025) which equals 5.13%, as Dr. Woolridge has calculated. The correct dividend yield to employ is 5%(1 + .05) = 5.25%, yielding a cost of equity of 10.25% instead of 10.13%.

Moreover, the plain vanilla annual DCF model ignores the time value of quarterly dividend payments and assumes dividends are paid once a year at the end of the year. Multiplying the spot dividend yield by (1 + g), as I have done and as Dr. Woolridge should have done, is a conservative attempt to capture the reality of quarterly dividend payments and still understates the expected return on equity. Dr. Woolridge's use of the (1 + 0.5g) adjustment is even further removed from reality and understates the investor's expected return by an even greater amount.

Since investors are aware of the quarterly timing of dividend payments, this knowledge is reflected in stock prices. As I show on pages 183-186 of my book, *Regulatory Finance*, the use of the annual version of the DCF model understates the cost of equity by approximately 30-40 basis points, depending on the magnitude of the dividend yield component.

By analogy, a bank rate on deposits which does not take into consideration the timing of the interest payments understates the true yield if you receive the interest payments more than once a year. The actual yield will exceed the stated nominal rate. To illustrate, if an investor has a choice between investing $1,000 in a bank account which promises a return of 10% compounded annually and another bank account which promises a return of 10% but compounded quarterly, he will clearly select the latter. Due to the quarterly compounding of interest, the investor earns an effective return of 10.38% on the latter bank account versus 10% on the former. The same is true for the return on common stocks.

IV. DCF STOCK PRICE

Q. PLEASE COMMENT ON DR. WOOLRIDGE'S STOCK PRICE IN THE DCF ANALYSIS.

A. In implementing his DCF analysis, Dr. Woolridge uses the average stock price over a five-month period ending May 2005 and the average stock price prevailing in May 2005. I disagree with the use of the former. Stale stock prices reaching back as far as January 2005 violate the notion of market efficiency.

The stock price to employ is the current price of the security at the time of estimating the cost of equity, rather than some historical average stock price

reaching back more than one year. The reason is that the analyst is attempting to determine a utility's cost of equity in the future, and since current stock prices provide a better indication of expected future prices than any other price according to the basic tenets of the Efficient Market Hypothesis, the most relevant stock price is the most recent one. The Efficient Market Hypothesis, which is widely accepted, states that capital markets, at least as a practical matter, incorporate into security prices relevant publicly available data such that current security prices reflect the most recent information and thus are the best representation of investor expectations. Use of any other price violates market efficiency.

There is yet another justification for using current stock prices. In measuring the cost of equity as the sum of dividend yield and growth, the period used in measuring the dividend yield component must be consistent with the estimate of growth that is paired with it. Since the current stock price is caused by the growth foreseen by investors at the present time and not at any other time, it is clear that the use of spot prices is preferable.

V. DCF DIVIDEND YIELD AND FLOTATION COSTS

Q. IN YOUR DIRECT TESTIMONY, YOU STATED THAT THE RETURN ON EQUITY SHOULD BE ADJUSTED TO INCLUDE AN ALLOWANCE FOR FLOTATION COSTS. PLEASE COMMENT ON FLOTATION COSTS.

A. Flotation costs are very similar to the closing costs on a home mortgage. In the case of issues of new equity, flotation costs represent the discounts that must be

provided to place the new securities. Flotation costs have a direct and an indirect component. The direct component represents monetary compensation to the security underwriter for marketing/consulting services, for the risks involved in distributing the issue, and for any operating expenses associated with the issue (printing, legal, prospectus, etc.). The indirect component represents the downward pressure on the stock price as a result of the increased supply of stock from the new issue. The latter component is frequently referred to as "market pressure."

Flotation costs for common stock is analogous to the flotation costs associated with past bond issues which, as a matter of routine regulatory policy, continue to be amortized over the life of the bond, even though no new bond issues are contemplated. In the case of common stock, which has no finite life, flotation costs are not amortized. Therefore, the recovery of flotation cost requires an upward adjustment to the allowed return on equity.

As demonstrated in my original testimony, the expected dividend yield component of the DCF model must be adjusted for flotation cost by dividing it by (1 - f), where f is the flotation cost factor.

Q. WHAT FLOTATION COST TREATMENT DID DR. WOOLRIDGE RECOMMEND IN THIS CASE?

A. Dr. Woolridge's common equity return recommendation does not include any allowance whatsoever for issuance expense. Because Dr. Woolridge fails to include any allowance for flotation costs, his DCF estimates of equity costs are downward-biased by approximately 30 basis points as a result of that omission

alone.

I am surprised by Dr. Woolridge's reluctance to accept flotation costs. The flotation cost allowance to the cost of common equity capital is routinely discussed and applied in most corporate finance textbooks.

Dr. Woolridge's position concerning flotation costs is inconsistent with the Value Line forecasts that show that natural gas utilities will be issuing new common stock in the future. According to the Value Line data source employed by Dr. Woolridge, the gas industry is scheduled to issue considerable amounts of new equity for 2007-2009.

Q. HOW DOES DR. WOOLRIDGE RATIONALIZE THE OMISSION OF FLOTATION COSTS?

A. Dr. Woolridge offers only one fragile reason as to why a flotation cost allowance is unwarranted. Dr. Woolridge's argument (Page 56 lines 4-9) is that CG&E has made no equity infusions in ULH&P over the past five years and that CG&E's planned equity infusion is for the electric side of the business. Dr. Woolridge's argument that flotation costs are not applicable to ULH&P because: 1) there has been no equity issue over the past five years; and 2) public common stock issues are conducted by the parent firm CG&E are specious and do not invalidate the need for a flotation cost adjustment.

The contention that a flotation cost allowance is inappropriate if the utility is a subsidiary whose equity capital is obtained from its parent is unfounded. This is because the parent-subsidiary relationship does not eliminate the costs of a new issue, but merely transfers them to the parent. It would be unfair and

discriminatory to subject the shareholders of a parent or utility holding company to dilution while shareholders of a stand-alone company are absolved from such dilution. Fair treatment must consider that if ULH&P had gone to the capital market-place directly flotation costs would have been incurred.

Dr. Woolridge's argument that a flotation cost adjustment is unwarranted because ULH&P's parent has not issued common stock for five years is irrelevant. What about the equity infusions prior to five years ago? The flotation cost allowance is designed to recover the flotation costs associated with all past issues that were not expensed, but rather written off against common equity. By analogy, in the case of a bond issue, flotation costs are amortized over the life of the bond, and the annual amortization charge usually is embedded in the cost of debt for ratemaking purposes. This is done whether the company intends to issue bonds in the future or not and/or whether the company has issued bonds in the past five years or not. The recovery of bond flotation expense continues year after year irrespective of whether the company issues new debt capital until recovery is complete, in the same way that the recovery of past investments in plant and equipment through depreciation allowances continues in the future even if no new construction is contemplated. In the case of common stock, which has no finite life, flotation costs are not amortized to a specific issuance as is the case for a bond. However, the recovery of flotation costs requires a similar upward adjustment to the return on equity that is allowed for ratemaking purposes. Unlike the case of bonds, common stock has no finite life so that flotation costs cannot be amortized and must therefore be recovered via an upward adjustment to

the allowed return on equity. As in the case of bonds, the recovery continues year after year regardless of whether the utility raises new equity capital until the recovery process is terminated.

My examination of past rate orders has failed to reveal any evidence that ULH&P's past flotation costs associated with past common equity issues have been recovered and that, therefore, the only recovery mechanism available for the recovery of such costs is an upward adjustment to the return on equity.

My own recommendation is that investors be compensated for flotation costs on an on-going basis because such costs were not expensed in the past, and therefore that the adjustment must continue for the entire time that these initial funds are retained in the firm. My Direct Testimony provided numerical illustrations which clearly show that, even if a utility does not contemplate any further common stock offerings, a flotation cost adjustment is still permanently required. This is analogous to the flotation costs associated with past bond issues, which continue to be amortized over the life of the bond, even though no new bond issues are contemplated.

In short, because Dr. Woolridge does not recognize flotation costs, his DCF estimates of equity costs are downward-biased by approximately 30 basis points, as shown in my Direct Testimony.

VI. DCF GROWTH RATES

Q. WHAT GROWTH RATE DID DR. WOOLRIDGE EMPLOY IN HIS DCF ANALYSIS?

A. Dr. Woolridge employs a veritable smorgasbord of growth rates as proxies for the DCF growth component. The eleven proxies are:

1. Historical growth rates in dividends per share, 5-year.
2. Historical growth rates in dividends per share, 10-year.
3. Historical growth rates in earnings per share, 5-year.
4. Historical growth rates in earnings per share, 10-year.
5. Historical growth rates in book value per share, 5-year.
6. Historical growth rates in book value per share, 10-year.
7. Value Line projected dividend growth.
8. Value Line projected earnings growth.
9. Value Line projected book value growth.
10. Value Line projected internal growth.
11. Consensus analysts' growth forecasts.

From all these growth rates, Dr. Woolridge concludes that a growth rate of 4.25% is appropriate for use in his DCF analysis. I have serious reservations with this shotgun approach to determining growth rates.

Q. PLEASE COMMENT ON DR. WOOLRIDGE'S GROWTH PROXIES.

A. Table 3 below replicates the average growth estimates for Dr. Woolridge's sample of natural gas utilities obtained from each proxy (see Woolridge Schedules 7.3, 7.4).

TABLE 3 - DR. WOOLRIDGE'S AVERAGE DCF GROWTH RATES

Historical 10-yr EPS	3.9%
Historical 10-yr DPS	2.0%
Historical 10-yr BPS	3.5%
Historical 5-yr EPS	4.9%
Historical 5-yr DPS	2.0%
Historical 5-yr BPS	3.5%
Value Line Proj EPS	5.1%
Value Line Proj DPS	2.2%
Value Line Proj BPS	6.0%

Projected Internal	4.2%
Analysts' Forecasts	4.6%
AVERAGE:	**3.8%**

Source: Woolridge Schedules 7.3, 7.4

The overall average growth rate from all the proxies is 3.8% for the group.

Q. WHAT ARE THE PROBLEMS WITH DR. WOOLRIDGE'S DCF GROWTH RATES?

A. There are four problems with Dr. Woolridge's approach to DCF growth rates:

1. They are difficult to replicate scientifically.
2. Unrepresentative and redundant historical growth rates.
3. Dividend growth rates.
4. Circularity in the Internal Growth method.

Q. WERE YOU ABLE TO SCIENTIFICALLY REPLICATE DR. WOOLRIDGE'S GROWTH ESTIMATE FROM THE DATA?

A. No, I was not. Dr. Woolridge reports a compendium of 11 growth rates which I have duplicated in Table 4 below. Somehow from all this historical and projected growth data, he derives an arbitrary range of 4.0% to 4.5% and uses the midpoint of 4.25% as his final growth estimate.

The choice of optimal growth rate proxy should be guided by objective scientific research and be easily reproducible, unlike Dr. Woolridge's growth proxies. The empirical finance literature shows that analysts' growth forecasts produces suitable proxies for the expected growth term in the DCF model. Dr. Woolridge's shotgun approach to growth rates is unreliable and arbitrary.

Q. PLEASE COMMENT ON THE RELIABILITY OF DR. WOOLRIDGE'S GROWTH PROXIES.

A. Table 4, Column 1 below replicates the average growth estimates for Dr. Woolridge's sample of gas utilities obtained from each proxy (see Woolridge Schedule 7.3, 7.4). The second column shows the growth average excluding dividend growth rates, the third column shows the growth average using only forecast growth data, and the last column shows the growth average using dividend growth proxies only.

TABLE 4 - DR. WOOLRIDGE'S GROWTH RATES NATURAL GAS UTILITIES GROUP

	ALL (1)	Excl DPS (2)	Forecasts (3)	Only DPS (4)	Forecasts (5)
Historical 10-yr EPS	3.9%	3.9%			
Historical 10-yr DPS	2.0%			2.0%	
Historical 10-yr BPS	3.5%	3.5%			
Historical 5-yr EPS	4.9%	4.9%			
Historical 5-yr DPS	2.0%			2.0%	
Historical 5-yr BPS	3.5%	3.5%			
Value Line Proj EPS	5.1%	5.1%	5.1%		5.1%
Value Line Proj DPS	2.2%		2.2%	2.2%	
Value Line Proj BPS	6.0%	6.0%	6.0%		6.0%
Projected Internal	4.2%	4.2%	4.2%		
Analysts' Forecasts	4.6%	4.6%	4.6%		4.6%
AVERAGE:	**3.8%**	**4.5%**	**4.4%**	**2.1%**	**5.2%**

Source: Dr. Woolridge Schedules 15-16

The overall average growth rate from all the proxies, as shown at the bottom of Column 1, is 3.8% for the group. It is very clear from this table that the dividend growth proxies average of 2.1% shown at the bottom of the Column 4 is

an outlier, compared to the average of 4.5% computed by excluding the dividend proxies (Column 2) and compared to the average of 4.4% obtained from the growth forecast proxies (Column 3). The last column shows the earnings and book value growth forecasts by Value Line and the consensus analysts' forecasts. The average forecast is 5.2%, and in my view the only relevant DCF growth proxy Dr. Woolridge should have used, as I show below.

I show below that historical growth rates are inappropriate proxies for expected growth at this time and that dividend growth, both historical and prospective, is an improper proxy as well. Excluding the historical proxies and the outlying dividend growth forecast from Column 3, the average growth estimates that should have been used by Dr. Woolridge is 5.2%, and not the 4.0% - 4.5% range used by Dr. Woolridge. Use of the former growth range would raise his DCF estimates by at least 100 basis points.

VII. HISTORICAL GROWTH RATES

Q. PLEASE DISCUSS THE USE OF HISTORICAL GROWTH RATES IN APPLYING THE DCF MODEL TO NATURAL GAS UTILITIES.

A. In arriving at his proxies for the DCF growth component, Dr. Woolridge considers historical growth rates as reported by Value Line (Schedule JRW-7.3). Although he reports and discusses these historical growth rates averaging 3% on Page 23 lines 15-19, he ends up using a range of 4.0% - 4.5%, so that it is difficult to tell to what extent he places reliance, if any, on historical growth rates. To the extent that he relied on history, I disagree.

Under circumstances of stability, it is reasonable to assume that historical

growth rates in dividends/earnings influence investors' assessment of the long-run growth rate of future dividends/earnings. However, because of sea changes in the energy industry, historical growth rates have little relevance as proxies for future long-term growth. They are downward-biased by the sluggish earnings performance in the last decade, due to the structural transformation of the energy utility business from a regulated monopoly to a competitive environment. Moreover, historical growth rates are largely redundant because such historical growth patterns are already incorporated in analysts' growth forecasts that should be used in the DCF model. I therefore recommend that the Commission reject historical growth rates as proxies for expected growth in the DCF calculation. In fairness to Dr. Woolridge, however, it is not clear to what extent, if any, he relied on historical growth rates in deriving his DCF estimates.

I therefore recommend that the use of historical growth rates as proxies for expected growth in the DCF calculation be rejected in this proceeding. In any event, as I discuss below, historical growth rates are largely redundant because such historical growth patterns are already incorporated in analysts' growth forecasts that should be used in the DCF model.

VIII. DIVIDEND GROWTH RATES

Q. SHOULD DR. WOOLRIDGE HAVE CONSIDERED DIVIDEND GROWTH PROXIES IN APPLYING THE DCF MODEL?

A. No, he should not. It is abundantly clear from the Tables 4 that the average dividend growth proxies of 2.1% is an outlier, when compared with the other proxies showing growth rates that are in the 4.6% - 5.2% range. Dr. Woolridge

should not have considered dividend growth in applying the DCF model. This is because it is widely expected that natural gas utilities will continue to lower their dividend payout ratio over the next several years in response to the gradual penetration of competition in the revenue stream. In other words, earnings and dividends are not expected to grow at the same rate in the future. From Table 4, the dividend growth of 2.2% for Dr. Woolridge's sample of natural gas utilities expected by Value Line is far less than the expected earnings growth of 5.1% over the next few years.

Whenever the dividend payout ratio is expected to change, the intermediate growth rate in dividends cannot equal the long-term growth rate, because dividend/earnings growth must adjust to the changing payout ratio. The assumptions of constant perpetual growth and constant payout ratio are clearly not met. The implementation of the standard DCF model is of questionable relevance in this circumstance.

Dividend growth rates are unlikely to provide a meaningful guide to investors' growth expectations for energy utilities. This is because utilities' dividend policies have become increasing conservative as business risks in the industry have intensified steadily. Dividend growth has remained largely stagnant in past years as utilities are increasingly conserving financial resources in order to hedge against rising business risks. To wit, the dividend payout ratios of energy utilities has steadily decreased from about 80% ten years ago to the 60% level today. As a result, investors' attention has shifted from dividends to earnings. Therefore, earnings growth provides a more meaningful guide to investors' long-

term growth expectations. After all, it is growth in earnings that will support future dividends and share prices.

IX. INTERNAL GROWTH METHOD

Q. PLEASE COMMENT ON DR. WOOLRIDGE'S INTERNAL GROWTH ESTIMATE IN THE DCF MODEL?

A. In order to estimate the growth component of the DCF model, Dr. Woolridge relies partially on the so-called "internal growth" method, sometimes referred to as the "sustainable growth" approach, where the growth rate is based on the equation g = b(ROE); b is the percentage of earnings retained and ROE is the expected rate of return on book equity (ROE).

I disagree with the internal growth technique for five reasons: 1) it does not account for the impact of external stock financing on growth, thus understating growth rates; 2) the method is logically circular, for it requires Dr. Woolridge to assume the ROE answer to begin with; 3) inconsistency with the academic empirical evidence; 4) the potential lack of representativeness of Value Line's forecasts as proxies for the market consensus; and 5) a technical error. I will now discuss each of these points in turn.

Q. DOES DR. WOOLRIDGE'S INTERNAL GROWTH METHODOLOGY ACCOUNT FOR EXTERNAL STOCK FINANCING?

A. No, it does not. Utilities engage in two kinds of operations: 1) investment decisions on which they earn the rate of return `r;, and 2) stock financing operations on which they earn at the rate `vs'. If a utility is expected to finance stock at the rate `s', the standard DCF model

$$K = D_1/P + g$$

is altered as follows. Since growth in book value per share results from both types of operations, now g = br + sv and not simply br, where:

s = funds raised from the sale of stock as a fraction of existing common equity

v = fraction of the funds raised from sale of stock that accrues to shareholders at the start of the period

Dr. Woolridge's internal growth methodology failed to recognize growth stemming from external stock financing. The expectation of continuous stock financing at the rate `s' changes the expected rate of growth from `br' to `br + sv'. By omitting the latter component of growth, Dr. Woolridge understates the growth of his sample of eight gas distribution utilities by approximately 40 basis points.

Q. ARE THE GROWTH RATES USED BY DR. WOOLRIDGE CONSISTENT WITH HIS RATE OF RETURN RECOMMENDATION?

A. No, they are not. Dr. Woolridge's internal growth methodology contains a puzzling logical contradiction. This is because the method requires an explicit assumption on the ROE expected from the retained earnings that drive future growth. Dr. Woolridge bases his ROE estimate on Value Line's forecast ROE for the 2007-2009 period. But the ROEs used by Dr. Woolridge in calculating his internal growth rate do not match Dr. Woolridge's ROE recommendation. Table 5 below replicates the ROE forecasts used by Dr. Woolridge in deriving his internal growth rates.

TABLE 5 - DR. WOOLRIDGE'S FORECAST ROE
INTERNAL GROWTH ESTIMATES

	Company	Expected ROE
1	AGL Resources	11.5%
2	Atmos Energy Corp.	9.0%
3	Cascade Natural Gas Corp.	11.5%
4	Keyspan Corp.	10.5%
5	Laclede Group, Inc.	8.0%
6	NICOR, Inc.	14.5%
7	Northwest Natural Gas Co.	10.0%
8	Peoples Energy Corp.	10.5%
9	Piedmont Natural Gas, Inc.	12.0%
10	South Jersey Industries, Inc	13.0%
11	WGL Holdings, Inc	12.0%
	AVERAGE:	**11.1%**

Source: Dr. Woolridge Schedule JRW-7.3

The average expected ROE of approximately 11% used in Dr. Woolridge's internal growth computation and reported on his Schedule 3 exceeds his recommended 8.7%. Dr. Woolridge is assuming in effect that his sample companies will earn a ROE exceeding what he has determined to be their cost of equity forever. That is, **he is assuming that these companies will earn a ROE higher than that granted by their regulators and reflected in their rates.** While this scenario implicit in Dr. Woolridge's internal growth method may be imaginable for an unregulated company with substantial market power, **it is implausible for a regulated company whose rates are set by its regulator at a level designated to permit the company to earn a return equal to its cost of capital.** I consider this logical flaw damaging to the integrity of Dr. Woolridge's analysis, and consider it to be a sufficient basis for rejecting Dr. Woolridge's results produced by this particular method. In essence, Dr. Woolridge is using an

ROE that differs from his final recommended cost of equity, and is requesting the Commission to make two inconsistent findings regarding ROE. I am perplexed as to why Dr. Woolridge assumes that his group of comparable natural gas utilities is expected to earn 11% forever, while at the same time he recommends an ROE of only 8.7%. The only way that these natural gas utilities can earn an ROE of 11% is if rates are set so that they will in fact earn 11%. The only logical conclusion to be drawn from the data is that the group's cost of equity is 11%, since these are the returns implied in Dr. Woolridge's internal growth analysis. So, how can the cost of equity be any different from 11%?

In short, Dr. Woolridge's implementation of the internal growth method is circular, for he is using an assumed ROE that exceeds his own recommended ROE. He is in effect using a growth forecast which implies that the companies will earn at a return rate exceeding his recommended equity range forever, while at the same time recommending that a different rate be authorized by the Commission.

Q. IS THE INTERNAL GROWTH RATE TECHNIQUE CONSISTENT WITH THE EMPIRICAL EVIDENCE?

A. No, it is not. The third difficulty with the internal growth rate approach is that the empirical finance literature demonstrates this particular method of determining growth is a very poor explanatory variable of market value, and is not as significantly correlated to measures of value, such as stock price and price/earnings ratios.

Q. ARE VALUE LINE'S ROE AND RETENTION RATIO ESTIMATES REPRESENTATIVE OF THE MARKET CONSENSUS?

A. No. The fourth difficulty with Dr. Woolridge's internal growth rates is that exclusive reliance on Value Line forecasts of ROE and retention ratio runs the risk that such forecasts are not representative of investors' consensus forecast.

Q. PLEASE DISCUSS THE FIFTH PROBLEM WITH DR. WOOLRIDGE'S INTERNAL GROWTH ESTIMATES.

A. The fifth difficulty with Dr. Woolridge's internal growth approach is that the forecasts of the expected return on equity published by Value Line are based on end-of-period book equity rather than on average book equity. The following formula, discussed and derived in Chapter 5 of my book, *Regulatory Finance*, adjusts the reported end-of-year values so that they are based on average common equity, which is the common regulatory practice:

$$r_a = r_t \frac{2 B_t}{B_t + B_{t-1}}$$

Where: r_a = return on average equity

r_t = return on year-end equity as reported

B_t = reported year-end book equity of the current year

B_{t-1} = reported year-end book equity of the previous year

The result of this error is that Dr. Woolridge's DCF estimates are understated by some 10-20 basis points, depending on the magnitude of the book value growth rate.

Q. WHAT DO YOU CONCLUDE FROM DR. WOOLRIDGE'S GROWTH RATE ANALYSIS?

A. If we dismiss the historical growth rates and the dividend forecasts from Dr. Woolridge's myriad proxies, we are left with analysts' growth forecasts. Given the analyst growth projections shown on Table 4 above for the sample group, Dr. Woolridge should have used a growth rate of close to 5.2% and not the 4.0% - 4.5% range used by Dr. Woolridge. Use of the latter growth rate would raise his DCF estimates by at least 100 basis points.

X. ANALYSTS' GROWTH FORECASTS

Q. IS THERE ANY EMPIRICAL EVIDENCE DOCUMENTING THE IMPORTANCE OF EARNINGS IN EVALUATING INVESTORS' EXPECTATIONS IN THE INVESTMENT COMMUNITY?

A. On Pages 69 and 79 of his testimony, Dr. Woolridge denounces the use of financial analysts' earnings forecasts, and chastises my own use of such forecasts. This critique is ironic given that he himself ends up basing his DCF growth range of 4.0% - 4.5% almost exclusively on analysts' earnings growth forecasts. Dr. Woolridge also laments the fact that I did not rely on dividend growth forecasts. I discussed the impropriety of relying on dividend growth earlier.

There is an abundance of evidence attesting to the importance of earnings in assessing investors' expectations. First, the sheer volume of earnings forecasts available from the investment community relative to the scarcity of dividend forecasts attests to their importance. To illustrate, Value Line, Zacks Investment, First Call Thompson, Yahoo Finance, and Multex provide comprehensive compilations of investors' earnings forecasts, to name some. The fact that these investment information providers focus on growth in earnings rather than growth

in dividends indicates that the investment community regards earnings growth as a superior indicator of future long-term growth. Second, a survey of analytical techniques actually used by analysts published in the *Financial Analysts Journal* revealed the dominance of earnings. When asked to rank the relative importance of earnings, dividends, cash flow, and book value in analyzing securities, only three ranked dividends first, while 276 ranked it last. The survey concluded that earnings are considered far more important than dividends. Third, Value Line's principal investment rating assigned to individual stocks, Timeliness Rank, is based primarily on earnings, accounting for 65% of the ranking.

Q. PLEASE DISCUSS THE USE OF ANALYSTS' FORECASTS IN APPLYING THE DCF MODEL TO UTILITIES.

A. The best proxy for the growth component of the DCF model is analysts' long-term earnings growth forecasts. These forecasts are made by large reputable organizations, and the data are readily available to investors and are representative of the consensus view of investors.

Q. WHAT DOES THE PUBLISHED ACADEMIC LITERATURE SAY ON THE SUBJECT OF GROWTH RATES IN THE DCF MODEL?

A. Published studies in the academic literature demonstrate that growth forecasts made by security analysts are reasonable indicators of investor expectations, and that investors rely on analysts' forecasts. Cragg and Malkiel ["Expectations and the Structure of Share Prices," Chicago: University of Chicago Press, 1982] present detailed empirical evidence that the average analysts' expectation is more similar to expectations being reflected in the marketplace than are historical

growth rates, and represents the best possible source of DCF growth rates. Cragg and Malkiel show that historical growth rates do not contain any information that is not already impounded in analysts' growth forecasts. A study by Professors Vander Weide and Carleton, "Investor Growth Expectations: Analysts vs. History" (*The Journal of Portfolio Management*, Spring 1988), also confirms the superiority of analysts' forecasts over historical growth extrapolations. Another study by Timme & Eiseman, "On the Use of Consensus Forecasts of Growth in the Constant Growth Model: The Case of Electric Utilities," *Financial Management,* Winter 1989, produces similar results.

Dr. Woolridge's denunciation of analysts' growth forecasts as unreasonable proxies for the DCF growth rate is without foundation and quite inconsistent with the empirical finance literature on the subject. It is paradoxical that Dr. Woolridge employs analysts' earnings forecasts from the Yahoo, Reuters, and Zacks websites (see Schedule JRW-7 page 4) as proxies for the DCF growth rate, yet criticizes my own use of earnings growth forecast from the same source.

XI. MARKET-TO-BOOK RATIO METHOD

Q. PLEASE DISCUSS DR. WOOLRIDGE'S VIEWS ON MARKET-TO-BOOK RATIOS.

A. Dr. Woolridge's testimony is replete with references to M/B ratios (pages 11, 12, 13, 33, 46, 47). Dr. Woolridge argues when a regulated utility has a M/B ratio greater than one, the earned return exceeds the cost of common equity, implying that the regulating authority should lower the allowed return on equity, so that the stock price will decline to book value. I presume from his statements that Dr.

Woolridge would find it plausible that stock prices drop from the current M/B value of well above 1.0 for most natural gas and electric utilities, to the desired M/B ratio range of 1.0.

There are several reasons why M/B ratios are largely irrelevant and why I disagree with Dr. Woolridge's views of the role of M/B in regulation.

First, Dr. Woolridge's testimony strongly implies that regulators should set an ROE so as to produce a M/B of 1.0. This is erroneous. The stock price is set by the market, not by regulators. The M/B ratio is the result of regulation, not its starting point. The regime of regulation envisioned by Dr. Woolridge, that is, that the regulator will set an allowed rate of return so as to produce a M/B of close to 1.0, presumes that investors commit capital to a utility with a M/B in excess of 1.0, knowing full well that they will be inflicted a capital loss by regulators. Such masochistic behavior on the part of investors is certainly not a realistic or accurate view of investment or regulation.

Second, while it is true that if investors expect a utility to earn an ROE equal to its cost of equity in each period, then its M/B ratio would be approximately 1.0, this is only true in a long-run sense and is only applicable to a utility: 1) whose assets are all 100% regulated; 2) whose rate base equals invested capital; and 3) when there is no inflation. None of these situations prevail.

Clearly, a company's achieved earnings in any given year are likely to exceed or be less than their long-run average. Depressed or inflated M/B ratios are to a considerable degree a function of forces outside the control of regulators, such as the general state of the economy, or general economic or financial

circumstances which may affect the yields on securities of unregulated as well as regulated enterprises. I regard the achievement of a 1.0 M/B ratio as appropriate, but only in a very long-run sense, for utilities with no unregulated assets, and in a world where historical costs of assets mirror replacement costs. For utilities to exhibit a long-run M/B ratio of 1.0, it is clear that during economic upturns and more favorable capital market conditions, the M/B ratio must exceed its long-run average of 1.0 to compensate for the periods during which the M/B ratio is less than its long-run average under less favorable economic and capital market conditions.

Finally, the traditional M/B does not reflect the replacement cost of a company's assets. The fundamental goal of regulation should be to set the expected economic profit for a public utility equal to the level of profits expected to be earned by firms of comparable risk, in short, to emulate the competitive result. For unregulated firms, the natural forces of competition will ensure that in the long-run the ratio of the market value of these firm's securities equals the replacement cost of their assets. This suggests that a fair and reasonable price for a public utility's common stock is one that produces equality between the market price of its common equity and the replacement cost of its physical assets. The latter circumstance will not necessarily occur when the M/B is 1.0. Only when the book value of the firm's common equity equals the value of the firm's equity at replacement cost will equality hold.

In an inflationary period, the replacement cost of a firm's assets may increase more rapidly than its book equity. To avoid the resulting economic

confiscation of shareholders' investment in real terms, the allowed rate of return should produce a M/B ratio which provides a Q-ratio of 1 or a Q-ratio equal to that of comparable firms. It is quite plausible and likely that M/B ratios will exceed one if inflation increases the replacement cost of a firm's assets at a faster pace than historical cost (book equity). Perhaps this explains in part why utility M/B ratios have remained well above 1.0 over the past two decades.

Q. ARE DR. WOOLRIDGE'S VIEWS ON THE MARKET-TO-BOOK RATIO CONSISTENT WITH HIS DCF ANALYSIS?

A. No, they are not. In his implementation of the internal growth DCF model shown on his Schedule 3, Dr. Woolridge uses assumed ROE which are considerably higher than his recommended cost of equity of 8.7% for ULH&P. In other words, he assumes that his sample of utilities will earn forever a return in excess of their cost of equity, or, in other words, that the M/B ratios of these companies will exceed 1.00 forever. This is inconsistent with Dr. Woolridge's view that M/B ratios should converge towards 1.00.

Q. DO YOU HAVE ANY MORE COMMENTS ON DR. WOOLRIDGE'S MARKET-TO-BOOK VIEWS?

A. Yes, I do. Dr. Woolridge's inference that utility stocks should trade at or near book value. It is highly unusual for utility stock prices to equal book value. Stock prices above book value are common for utility stocks, and indeed for all of the major market indexes. It is obvious that regulators, through their rate case decisions, and investors do not subscribe to Dr. Woolridge's position that utilities that have market prices above book value are over-earning. Otherwise, regulators

would not grant rate increases for any utility whose stock price was above book value, and investors would never bid up the price of stock above book value. It is very difficult to accept Dr. Woolridge's notion that, in a free-market economy with rampant competition, the vast majority of all publicly-traded stocks are earning well in excess of their cost of capital.

Dr. Woolridge's views on the role of M/B are certainly not corroborated by the historical facts. Utility M/B ratios have been consistently above 1.00 for almost two decades. Are we to conclude that regulators have been systematically misguided all across the United States for all these years? Or are we to conclude that M/B ratios are largely irrelevant, and that Dr. Woolridge's views on the role of M/B ratios are erroneous? I subscribe to the latter view.

Moreover, there is a flagrant logical contradiction in Dr. Woolridge's views on M/B ratios and his use of the standard DCF model. Given his view that a M/B of 1.0 indicates that investors return requirements are being met and that a M/B ratio greater than 1.00 indicates that utilities are expected to continue to earn returns on equity in excess of their equity costs, inferring that regulators should set allowed rates of return so as to produce a M/B ratio of 1.00, Dr. Woolridge goes on to use the standard DCF model.

The standard DCF model assumes that the current M/B ratio will prevail forever. I find this assumption difficult, if not impossible, to reconcile with Dr. Woolridge's views on the role of M/B in regulation and that the M/B should tend to 1.00. A projected decrease in the M/B ratio will produce a capital loss to the investor which is a legitimate part of investor return requirements. When

estimating the cost of equity for utilities whose market price differs from book value, the standard DCF model must be corrected because the growth in stock price has to differ from the growth in dividends if the stock price is to converge to book value. The standard DCF model suppresses such capital gains or losses by assuming an infinite investment horizon.

Dr. Woolridge did not allow for such capital losses. If Dr. Woolridge expects M/B ratios to decrease to 1.0 through downward adjustments in the allowed rate of return, he should have accounted for the fact that the rate of stock price depreciation is less than the growth in earnings, contrary to the standard DCF model's assumptions that the firm's earnings per share grow at a constant rate forever and/or that the firm's price/earnings ratio is constant. His application of the standard DCF model results in a biased estimate of the cost of equity to a public utility whose current market-to-book ratio deviates from 1.0 and which is expected to converge towards one.

XII. CAPM RISK-FREE RATE

Q. DOES DR. WOOLRIDGE PERFORM A CAPM ANALYSIS?

A. Yes, he does. Although he does not rely on the results of this methodology, Dr. Woolridge performs a CAPM analysis of the cost of common equity and devotes an inordinate amount of space to the CAPM in his testimony considering that he did not rely on its results. The results of his CAPM study are summarized on Page 45 of his testimony.

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S CAPM ANALYSIS?

A. No, I do not. To implement the CAPM, three quantities are required: the risk-free rate (R_F), beta (β), and the market risk premium, (R_M - R_F). Dr. Woolridge uses a risk-free rate of 4.5%, a beta of 0.76, and a market risk premium ("MRP") of only 3.7%. I have serious issues with all three inputs, especially the Lilliputian estimate of the MRP.

Q. DR. MORIN, DO YOU AGREE WITH DR. WOOLRIDGE'S RISK-FREE RATE IN THE CAPM ANALYSIS?

A. No, I do not. Dr. Woolridge uses a risk-free rate based on the prevailing yield on 10-year Treasury bonds rather than my yield based on 30-year Treasury bonds. The appropriate proxy for the risk-free rate in the CAPM is the return on very long-term Treasury bonds. This is simply because common stocks are very long-term instruments more akin to very long-term bonds. The ideal estimate for the risk-free rate has a term to maturity equal to the security being analyzed. Because common equity has an infinite life-span, the inflation expectations embodied in its market-required rate of return will be equal to the inflation rate anticipated to prevail over the long-term. Among U.S. Treasury securities, 30-year U.S. Treasury bonds have the longest term to maturity. Therefore, 30-year U.S. Treasury bonds will most closely incorporate within their yield the inflation expectations that influence the prices of common stocks.

The fact that the U.S. Treasury no longer issues 30-year bonds is immaterial. In the same way that we can use stock prices in the application of the DCF model to a given company even though that company has not issued stock in

the recent past, we can rely on bond prices of 30-year Treasury bonds and the implied yields. Thirty-year Treasury bonds are actively traded on secondary markets and provide useful price/yield signals.

While on the subject of the risk-free rate, Dr. Woolridge criticizes my use of a forecast interest rate on the grounds that "services like Consensus Economics are always forecasting interest rates to go up." Nowhere does Dr. Woolridge substantiate this gratuitous statement. One wonders why large reputable institutional investors would ever subscribe to commercial services that provide such forecasts, like Consensus Economics, if such services always produced erroneous forecasts. Besides, give that regulation is prospective in nature, or should be, it makes ample sense to examine interest rate forecasts when setting rates for the future.

XIII. CAPM BETA ESTIMATES

Q. DR. MORIN, DID YOU NOTICE ANY INCONSISTENCY IN DR. WOOLRIDGE'S BETA ESTIMATES?

A. Yes, I did. On page 14 of his testimony line 10, Dr. Woolridge reports that public utilities have a beta of 0.65, that is, they are 65% as volatile as the average equity investment. Yet, in his CAPM analysis summarized on page 45, he utilizes a beta estimate of 0.76. It is not clear as which beta Dr. Woolridge considers as the correct estimate.

XIV. CAPM MARKET RISK PREMIUM

Q. HOW DOES DR. WOOLRIDGE ESTIMATE THE MARKET RISK PREMIUM COMPONENT OF THE CAPM?

A. In order to determine the MRP component of the CAPM, Dr. Woolridge rejects

historical estimates of the MRP and relies instead on a variety of published studies that have examined prospective estimates of the market risk premium to arrive at an arbitrary figure of 3.7%. This estimate is flawed and surprisingly low for several reasons. First, he relies on the geometric average returns rather than arithmetic average returns from the studies he chose to examine. Second, Dr. Woolridge rejects historical studies of the MRP, on the grounds that the MRP has declined in past years and presumably because historical estimates are too high and his assessment of the literature on the subject is skewed. Third, there is a serious logical contradiction in his MRP estimate. I discuss each of these three issues in turn.

CAPM: ARITHMETIC VS. GEOMETRIC AVERAGES

Q. PLEASE COMMENT ON THE USE OF ARITHMETIC AVERAGES VERSUS GEOMETRIC AVERAGES IN MEASURING EXPECTED RETURN.

A. One major issue relating to the use of realized returns is whether to use the ordinary average (arithmetic mean) or the geometric mean return. Dr. Woolridge relies on the geometric mean return in deriving the MRP component of his CAPM analysis, and criticizes my use of arithmetic averages. This is wrong. Only arithmetic means are correct for forecasting purposes and for estimating the cost of capital. As demonstrated formally in Chapter 11 of my book, *Regulatory Finance*, and in Brealy & Myers' best-selling corporate finance textbook, *Principles of Corporate Finance*, only arithmetic averages can be used as estimates of cost of capital, and the geometric mean is not an appropriate measure

of the cost of capital. I also note that the widely-cited Ibbotson Associates publication cited by Dr. Woolridge on pages 38, 58, and 60-61 contains a detailed and rigorous discussion of the impropriety of using geometric averages in estimating the cost of capital. There is no theoretical or empirical justification for the use of geometric mean rates of returns. I know of no textbook on finance or scientific journal article which advocates the use of the geometric mean as a measure of the appropriate discount rate in **computing the cost of capital or in computing present values.**

The net effect of Dr. Woolridge's use of the geometric mean market risk premium rather than the arithmetic mean is to decrease his estimates of the required market return by 1.60%, that is, the difference between the arithmetic and geometric mean reported in the aforementioned Ibbotson Associates publication. This in turn translates into an understatement of ULH&P's cost of equity by approximately 1.2% (120 basis points). The latter estimate is derived by assuming that ULH&P's beta is 0.76 from Dr. Woolridge's Schedule 7 and multiplying that beta by 1.6%, the difference between the arithmetic and geometric mean risk premiums for stocks over government bonds.

Q. CAN YOU PROVIDE A BRIEF EXPLANATION AS TO WHY THE ARITHMETIC MEAN IS PREFERABLE TO THE GEOMETRIC MEAN WHEN ESTIMATING THE COST OF CAPITAL?

A. The use of the arithmetic mean appears counter-intuitive at first glance, because we commonly use the geometric mean return to measure the average annual achieved return over some time period. For example, the long-term performance

of a portfolio is frequently assessed using the geometric mean return.

But performance appraisal is one thing, and cost of capital estimation is another matter entirely. In estimating the cost of capital, the goal is to obtain the rate of return that investors expect, that is, a target rate of return. On average, investors expect to achieve their target return. This target expected return is in effect an arithmetic average. The achieved or retrospective return is the geometric average. In statistical parlance, the arithmetic average is the unbiased measure of the expected value of repeated observations of a random variable, not the geometric mean.

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

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

the occurrence of higher than expected returns than is lost by lower than expected returns.

In capital markets, where returns are a probability distribution, the answer that takes account of uncertainty, the arithmetic mean, is the correct one for estimating discount rates and the cost of capital. In conclusion, Dr. Woolridge commits a serious error in logic by relying on geometric averages rather than on the conceptually correct arithmetic averages of historical returns. I know of no valid textbook, article, or professional journal that advocates discounting cash flows (estimating cost of capital) using the geometric rate of return.

While it is true that a geometric mean is correct and indeed appropriate when measuring performance over a long time period, it is incorrect when estimating a risk premium to compute the cost of capital.

Q. ARE THERE THEORETICAL REASONS WHY THE ARITHMETIC MEAN IS THE CORRECT ONE?

A. Yes, there are. The geometric mean measure the magnitude of the returns, as the investor starts with one portfolio and ends with another. It does not measure the variability of the journey, as does the arithmetic mean. The geometric mean is backward looking. There is no difference in the geometric mean of two stocks or portfolios, one of which is highly volatile and the other of which is absolutely stable. The arithmetic mean, on the other hand, is forward looking in that it does impound the volatility of the stocks.

To illustrate, Table 6 below shows the historical returns of two stocks, the first one is highly volatile with a standard deviation of returns of 65% while the

second one has a zero standard deviation and is therefore riskless. It makes no sense intuitively that the geometric mean is the correct measure of return, one that implies that both stocks are equally risky since they have the same geometric mean. No rational investor would consider the first stock equally as risky as the second stock. Every financial model to calculate the cost of capital recognizes that investors are risk averse and avoid risk unless they are adequately compensate for undertaking it. It is more consistent to use the mean that fully impounds risk (arithmetic mean) than the one from which risk has been removed (geometric mean).

TABLE 6 - GEOMETRIC VS. ARITHMETIC RETURNS

	Stock A	Stock B
1995	50.0%	11.6%
1996	-54.7%	11.6%
1997	98.5%	11.6%
1998	42.2%	11.6%
1999	-32.3%	11.6%
2000	-39.2%	11.6%
2001	153.2%	11.6%
2002	-10.0%	11.6%
2003	38.9%	11.6%
2004	20.0%	11.6%
Standard Deviation:	**64.9%**	**0.0%**
Arithmetic Mean:	**26.7%**	**11.6%**
Geometric Mean:	**11.6%**	**11.6%**

Q. ARE THERE EMPIRICAL REASONS WHY THE ARITHMETIC MEAN IS THE CORRECT ONE?

A. Yes, there are. If both the geometric and arithmetic means for the Ibbotson

deciles for 1926-2003 data are regressed against the standard deviation of returns for the firms in the deciles, the arithmetic mean outperforms the geometric mean in this statistical regression. Moreover, the constant of arithmetic mean regression matches the average Treasury bond rate and therefore makes economic sense while the constant for the geometric mean matches nothing in particular. This is simply because the geometric mean is stripped of volatility information and, as a result, does a poor job of forecasting returns based on volatility.

Q. CAN YOU COMMENT ON THE VIEWPOINTS OFFERED BY LEADING CORPORATE FINANCE TEXTBOOKS ON THE ISSUE OF THE ARITHMETIC MEAN?

A. Yes. In their widely-used investment management textbook, Bodie, Kane, and Marcus, (*Investments*, McGraw Hill, 5th Edition) strongly advocate the use of the arithmetic mean in estimating the cost of capital. The authors offer the following example in Chapter 24. Incidentally, this is the same numerical example used by Dr. Woolridge on pages 60-61 of his testimony in order to indict my use of arithmetic means. That example actually proves that the arithmetic mean provides the best guide to expected future returns, and not the geometric mean as Dr. Woolridge contends. As shown in the table below, consider a stock that will either double in value (return = 100%) with a probability of 0.5, or halve in value (return = -50%) with probability of 0.5.

Outcome	Final value of $1 invested	1-yr return
Double	$2.00	100%
Halve	$0.50	-50%

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

$$1 + r_g = [(1 + r_1)(1 + r_2)]^{1/2}$$

$$= [(1 + 1)(1 - .50)]^{1/2} = 1$$

$$r_g = 0$$

confirming that a zero year-by-year return would have replicated the total return earned on the stock. The expected annual future rate of return on the stock is not zero, however. It is the arithmetic average of 100% and -50%, (100-50)/2 = 25%. There are two equally likely outcomes per dollar invested: either a gain of $1 when r = 100% or a loss of $0.50 when r = -50%. The expected profit is ($1-$.50)/2 = $.25 for a 25% expected rate of return. The profit in the good year more than offsets the loss in the bad year, despite the fact that the geometric return is zero. **The arithmetic average return thus provides the best guide to expected future returns.** In conclusion, Dr. Woolridge should have heeded professors Bodie, Kane, and Marcus' advice, and commits a serious logical error by relying on geometric averages rather than on the conceptually correct arithmetic averages of historical returns.

The following extract from a widely utilized corporate finance textbook illustrates the distinction between arithmetic and geometric averages and concludes that arithmetic averages are appropriate when estimating the cost of capital.

The proper uses of arithmetic and compound rates of return from past investments are often misunderstood. Therefore, we call a brief time-out for a clarifying example.

Suppose that the price of Big Oil's common stock is $100. There is an equal chance that at the end of the year the stock will be worth $90, $110, or $130. Therefore, the return could be –10 percent, +10 percent or +30 percent (we assume that Big Oil does not pay a dividend). The expected return is 1/3(-10+10+30)= +10 percent.

If we run the process in reverse and discount the expected cash flow by the expected rate of return, we obtain the value of Big Oil's stock:

$$PV = \frac{110}{1.10} = \$100$$

The expected return of 10 percent is therefore the correct rate at which to discount the expected cash flow from Big Oil's stock. It is also the opportunity cost of capital for investments which have the same degree of risk as Big Oil.

Now suppose that we observe the returns on Big Oil stock over a large number of years. If the odds are unchanged, the return will be –10 percent in a third of the years, +10 percent in a further third, and +30 percent in the remaining years. The arithmetic average of these yearly returns is

$$\frac{-10+10+30}{3} = +10\%$$

Thus, the arithmetic average of the returns correctly measures the opportunity cost of capital for investments of similar risk to Big Oil stock.

The average compound annual return on Big Oil stock would be

$$(.9 \times 1.1 \times 1.3)^{1/3} - 1 = .088, \text{ or } 8.8\%$$

less than the opportunity cost of capital. Investors would not be willing to invest in a project that offered an 8.8 percent expected return if they could get an expected return of 10 percent in the capital markets. The net present value of such a project would be

$$NPV = -100 + \frac{108.8}{1.1} = -1.1$$

> Moral: If the cost of capital is estimated from historical returns or risk premiums, use arithmetic averages, not compound annual rates of return. (Richard A. Brealey and Stewart C. Myers, *Principles of Corporate Finance*, 7th Edition, Irwin McGraw-Hill, 2003, page 156-7.)[2]

CAPM: MARKET RISK PREMIUM

Q. IS DR. WOOLRIDGE'S ASSESSMENT OF THE RESEARCH ON THE MARKET RISK PREMIUM OF 3.7% ACCURATE?

A. No, it is not. His assessment of the state of research in this area is inaccurate and incomplete. His estimate of 3.7% is nowhere near a reasonable estimate. Ibbotson's *Stocks, Bonds, Bills, and Inflation 2005 Yearbook* is a primary source of data on U.S. capital market returns. This annual publication compiles monthly returns to various asset classes from 1926 to date. From Ibbotson 2005, a broad market sample of U.S. common stocks outperformed long-term U.S. government bonds by 6.6%. The historical market risk premium over the income component of long-term Treasury bonds rather than over the total return is 7.2%. It has been common practice to assume that this historical result provides an adequate basis for the expected MRP. In their widely-used aforementioned textbook, Brealey & Myers state:

> We have no official position on the exact market risk premium, but we believe a range of 6 to 8.5 percent is reasonable for the United States. We are most comfortable with figures toward the upper

[2] A survey published in 1998 found that 71% of textbooks/tradebooks used a historical arithmetic mean as the market risk premium and 60% of financial advisors used either a market risk premium of 7.0-7.4% (similar to the arithmetic mean) or a long-term arithmetic mean. For corporations, there was no single method that represented a consensus. Robert F. Bruner, Kenneth M. Eades, Robert S. Harris, and Robert C. Higgins, "Best Practices in Estimating the Cost of Capital: Survey and Synthesis," *Financial Practice and Education*, Vol. 8, Number 1, Spring/Summer 1998, page 18.

end of the range.

Because they are referring to the premium over Treasury Bills which is about 1.5% greater than the premium over bonds (Ibbotson 2004), this implies that Brealey & Myers would look to the upper end of a range of 4.5% to 7% for the MRP, again a long way from Dr. Woolridge's 3.7% assessment.

In his direct testimony Dr. Woolridge quotes Professor Siegel[3] who has examined historical data over even longer time series, including data prior to 1926, some dating back to 1802. An obvious question is whether data on capital market behavior from the 19th century relevant for estimating return in the 21st century. The major concern with the Siegel data for a period beginning in 1802 is the reliability of the data. The stock market of the early 1800's was severely limited, embryonic in scope, with very few issues trading, and few industries represented. Dividend data were unavailable over most of this early period and stock prices were based on wide bid-ask spreads rather than on actual transaction prices. The difficulties inherent in stock market data prior to the Great Depression are discussed by Schwert.[4]

Dr. Woolridge also refers to published work by Dimson, Marsh, and Staunton[5] who report on returns over the period 1900 to 2000 for twelve countries, representing 90% of today's world market capitalization. They report an average risk premium over long bond returns over all countries of 5.6%, with

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[3] Siegel, Jeremy (1999) "The shrinking equity premium." *Journal of Portfolio Management* 26(1): 10-17.
[4] Schwert, G. W., "Indexes of U.S. Stock Prices from 1802 to 1987," *Journal of Business*, 1990, Vol. 63, no. 3.
[5] Dimson, Elroy, Paul Marsh and Mike Staunton (2000) "Risk and Return in the 20th and 21st centuries." *Business Strategy Review* 11(2): 1-18.

the U.S. at 7.0%. The premium was generally higher for the second half century than for the first. For example, the U.S. had 5% in the first half, compared to 7.5% in the second half, again a long way from Dr. Woolridge's 3.7% estimate.

A second approach to estimate the MRP is prospective in nature and consists of applying the DCF model to an aggregate equity index, as I did in my direct testimony. Dr. Woolridge cherry picks a similar prospective study by Ibbotson and Chen, the basis for his 3.0% - 4.5% market risk premium. In fact, the Ibbotson-Chen study estimates a MRP of 5.90% on an arithmetic basis. It is noteworthy that the authors conclude their paper by stating that their estimate of the equity risk premium is *"far* closer to the historical premium than being zero or negative."

A prospective study cited in direct testimony and published in *Financial Management* by Harris, Marston, Mishra, and O'Brien ("HMMO") provides estimates of the ex ante expected returns for S&P 500 companies over the period 1983-1998.[6] HMMO measure the expected rate of return (cost of equity) of each dividend-paying stock in the S&P 500 for each month from January 1983 to August 1998 by using the constant growth DCF model. The prevailing risk-free rate for each year is then subtracted from the expected rate of return for the overall market to arrive at the market risk premium for that year. From that study, the average market risk premium estimate for the overall period is 7.2%, again a long way from Dr. Woolridge's 3.7%. Dr. Woolridge dismisses the HMMO study on the grounds that the authors relied on analysts' growth forecasts in the

DCF estimates of the MRP, and that such forecasts are dubious, according to Dr. Woolridge. Yet, in his principal proxy for the DCF growth rate, Dr. Woolridge also relied on analysts' growth forecasts (see his Schedule 7.4).

Surveys of academics and investment professionals, for example the Welch surveys[7] cited by Dr. Woolridge, provide another technique of estimating the MRP. While this technique has the benefit of being forward-looking, it is subject to the well-known shortcomings of survey techniques. There are several reasons to place little weight on survey results relative to the results from other approaches. First, return definitions and risk premium definitions differ widely. Second, survey responses are subject to bias. Thirdly, subjective assessments about long-term market behavior may well place undue weight on recent events and immediate prospects.

Keeping these limitations in mind, Welch surveyed finance professors on their views about the long-term equity premium in 1998 and again in 2001. The arithmetic mean long-term expected risk premium of respondents in the 2001 survey for the U.S. was 7.1% in 1998 and 5.5% in 2001, again a long way from Dr. Woolridge's 3.7%. Given the deplorable behavior of equity markets in the 2000-2002 period, it would not be surprising to see an upward reassessment of those risk premiums.

On page 31 of his testimony, Dr. Woolridge refers to a "famous" study by

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[6] Harris, R. S., Marston, F. C., Mishra, D. R., and O'Brien, T. J., "*Ex Ante* Cost of Equity Estimates of S&P 500 Firms: The Choice Between Global and Domestic CAPM," *Financial Management*, Autumn 2003, pp. 51-66.

[7] Welch, Ivo (2000, 2001), "Views of Financial Economists on the Equity Premium and on Professional Controversies," *Journal of Business* 73(4): 501-537.

Mehra and Prescott in which the authors first questioned the magnitude of historic equity risk premiums relative to fundamentals. I shall end this section of my rebuttal by citing two passages from Professors Mehra and Prescott's review of the theoretical literature on the MRP:

> Even if the conditional equity premium given current market conditions is small, and there appears to be general consensus that it is, this in itself does not imply that it was obvious either that the historical premium was too high or that the equity premium has diminished.
>
> In the absence of this [knowledge of the future], and based on what we currently know, we can make the following claim: over the long horizon the equity premium is likely to be similar to what it has been in the past and the returns to investment in equity will continue to substantially dominate that in T -bills for investors with a long planning horizon.

Dr. Woolridge should heed these authors' advice on the magnitude of the MRP.

Q. IS DR. WOOLRIDGE'S MARKET RISK PREMIUM ESTIMATE OF 3.7% CONSISTENT WITH REGULATORY DECISIONS?

A. No, it is not. It is useful to examine the MRP estimates implicit in regulatory ROE decisions. The CAPM framework can be used to quantify the MRP implicit in the allowed risk premiums for regulated utilities. According to the CAPM, the risk premium is equal to beta times the market risk premium:

$$\text{Risk Premium} = \beta (R_M - R_F)$$

$$\text{Risk Premium} = \beta \times \text{MRP}$$

Solving for MRP, we obtain:

MRP = Risk Premium / β

I examined the MRPs implied in 220 regulatory decisions for electric utilities in the United States over the period 1995-2004.[8] Using the allowed average risk premium of 5.4% in these decisions over the last decade and a beta of 0.75 for U.S. electric utilities, the implied market risk premium is 7.2%, again a long way from Dr. Woolridge's 3.7%. Similar results obtain when using regulatory decisions for natural gas utilities.

MARKET RETURN VS. UTILITY RETURN

Q. DID YOU DETECT ANY LOGICAL INCONSISTENCY IN DR. WOOLRIDGE'S ROE RECOMMENDATION?

A. Yes, I detected a major contradiction in Dr. Woolridge's testimony. Dr. Woolridge recommends a ROE of 8.7% on ULH&P's common equity capital, while at the same time he advocates a return on the total equity market of 7.9%, as shown on page 41 of his testimony, following a lengthy discussion on the appropriate MRP. Dr. Woolridge's ROE recommendation for ULH&P is inconsistent with his market return estimate. ULH&P and utilities generally are less risky than the overall market (ULH&P's beta is 0.65 or 0.76 according to Dr. Woolridge) and, therefore, should have a lower expected return than the overall market return of 7.9%. Yet, Dr. Woolridge's recommended ROE for ULH&P is higher than the expected return for the market as a whole. This is patently illogical. In order to be consistent with his own view of stock market returns of 7.9% and ULH&P's beta of 0.76 (meaning that ULH&P is 76% as risky as the

[8] This study is described in more details later in my testimony.

overall stock market), Dr. Woolridge should have recommended a ROE of 5.9%, that is 0.76 times 7.9%. That result is completely preposterous, of course. Dr. Woolridge does not explain this serious logical contradiction.

XV. CAPM AND THE EMPIRICAL CAPM

Q. DO YOU AGREE WITH THE USE OF THE RAW FORM OF THE CAPM USED BY DR. WOOLRIDGE TO ESTIMATE THE COST OF CAPITAL?

A. No, I do not. I believe that the plain vanilla version of the CAPM should be supplemented by the more refined version of the CAPM. There have been countless empirical tests of the CAPM to determine to what extent security returns and betas are related in the manner predicted by the CAPM. The results of the tests support the idea that beta is related to security returns, that the risk-return tradeoff is positive, and that the relationship is linear. The contradictory finding is that the risk-return tradeoff is not as steeply sloped as the predicted CAPM. That is, low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted. I was surprised that Dr. Woolridge was unaware of this important financial literature, for this is one of the most well-known results in finance. A CAPM-based estimate of the cost of capital underestimates the return required from low-beta securities and overstates the return from high-beta securities, based on the empirical evidence. The empirical form of the CAPM that I used in my direct testimony refines the standard form of the CAPM to account for this phenomenon. More on this later.

As discussed in Appendix A of my direct testimony, my own empirical investigation of the relationship between return and Value Line adjusted betas is

quite consistent with the general findings of the literature referred to above.

The downward-bias inherent in the CAPM is particularly significant for low-beta securities, such as the natural gas utilities used by Dr. Woolridge. Dr. Woolridge's CAPM estimates of equity costs are understated by about 50 basis points from this bias alone.

XVI. INTEREST RATE FORECASTS

Q. DOES DR. WOOLRIDGE'S ROE RECOMMENDATION TAKE INTO ACCOUNT INTEREST RATE FORECASTS?

A. No, it does not. Dr. Woolridge refers to selected interest rate data and makes the point that the decline in interest rates in recent periods justifies a significant reduction in ROE. However, to the extent that interest rates rise from their current levels, the cost of equity determined from recent data will understate future capital costs. The prospect of higher interest rates rather than lower interest rates looms much larger at this time. Already, we have witnessed several increases in the Federal Funds rate by the Federal Reserve in the past twelve months. Coupled with record-high federal deficits and balance-of-payments deficits, these policy actions are indicative of rising long-term interest rates. Indeed, forecasts of long-term interest rates indicate that interest rates are expected to increase from their current levels. Thus, the 8.7% ROE recommended by Dr. Woolridge is certainly not reflective of the forecast increase in capital costs.

XVII. RESPONSES TO DR. WOOLRIDGE'S CRITICISMS

Q. WHAT ARE DR. WOOLRIDGE'S MAJOR CONCERNS WITH YOUR TESTIMONY?

A. As stated on page 48, he has four major concerns: 1) the use of forecast risk-free rate of interest; 2) a MRP estimate that is too high; 3) analysts' growth forecasts that are upwardly-biased in the DCF model; and 4) an unnecessary flotation cost adjustment. I have previously commented on all these issues and found that Dr. Woolridge's criticisms are unfounded.

There are other minor concerns with my testimony expressed by Dr. Woolridge. I address these minor concerns below.

HISTORICAL RISK PREMIUM

Q. HOW DO YOU RESPOND TO DR. WOOLRIDGE'S CRITICISM OF YOUR RISK PREMIUM METHOD?

A. On pages 64-67 of his testimony, especially on page 65 lines 1-7, Dr. Woolridge chastises my use of historical stock and bond returns over long time periods to estimate expected risk premiums because: 1) risk premiums change over time; 2) realized rates of return are not necessarily indicative of investor expectations; and 3) for the use of arithmetic average returns rather than the geometric average. I strongly disagree with Dr. Woolridge's views. I have already dealt with the use of arithmetic vs. geometric means, so let me respond to the first two objections.

Q. PLEASE COMMENT ON DR. WOOLRIDGE'S CRITICISM THAT HISTORICAL RISK PREMIUMS ARE UNSTABLE AND HAVE TRENDED DOWNWARD.

A. Dr. Woolridge argues that my historical risk premium analysis is suspect because risk premiums are unstable and change over time. Moreover, he contends, the stock-bond risk premium has shrunk in recent years. I disagree. To the extent that the historical equity risk premium estimated follows what is known in statistics as a random walk, one should expect the equity risk premium to remain at its historical mean. Therefore, the best estimate of the future risk premium is the historical mean, which is what I used in my testimony. Contrary to Dr. Woolridge's belief, there are no statistically significant trends in historical risk premiums. Since the Ibbotson & Associates study, cited by Dr. Woolridge himself, finds very little serial correlation between successive annual risk premiums and no evidence that the market price of risk or the amount of risk in common stocks has changed over time, it is reasonable to assume that these quantities will remain stable in the future.

Q. PLEASE COMMENT ON DR. WOOLRIDGE'S ASSERTION THAT HISTORICAL RISK PREMIUMS ARE IMPERFECT PROXIES FOR EXPECTED RISK PREMIUMS.

A. Dr. Woolridge argues that historical risk premiums run the danger of being unrepresentative of expected risk premiums. While it is true that the historical risk premium approach fundamentally assumes that average realized return is an appropriate surrogate for expected return, or in other words that investors'

expectations are realized, historical return studies over long periods still provide a useful guide for the future. This is because over long periods investors' expectations and realizations converge. Otherwise investors would never commit investment capital. Investors' expectations are eventually revised to match historical realizations, as market prices adjust to bring anticipated and actual investment results into conformity. In the long-run, the difference between expected and realized risk premiums will decline because short-run periods during which investors earned a lower risk premium than they expected are offset by short-run periods during which investors earned a higher risk premium than they expected.

I have ignored realized risk premiums measured over short time periods, since they are heavily dependent on short-term market movements. Instead, I have relied on results over periods of enough length to smooth out short-term aberrations, and to encompass several business and interest rate cycles. The use of the entire study period in estimating the appropriate market risk premium minimizes subjective judgment and encompasses many diverse regimes of inflation, interest rate cycles, and economic cycles.

Q. DOES DR. WOOLRIDGE'S REFERENCE TO FEDERAL RESERVE CHAIRMAN GREENSPAN'S 1999 SPEECH SUPPORT THE NOTION OF A DECLINING RISK PREMIUM?

A. No, it does not. On page 5 of his testimony, Dr. Woolridge cites the following six-year old quote from one of Federal Reserve Bank Chairman Greenspan's many speeches:

> There can be little doubt that the dramatic improvements in information technology in recent years have altered our approach to risk. Some analysts perceive that information technology has permanently lowered equity premiums and, hence, permanently raised the prices of the collateral that underlies all financial assets.
>
> The reason, of course, is that information is critical to the evaluation of risk. The less that is known about the current state of a market or a venture, the less the ability to project future outcomes and, hence, the more those potential outcomes will be discounted.
>
> The rise in the availability of real-time information has reduced the uncertainties and thereby lowered the variances that we employ to guide portfolio decisions. At least part of the observed fall in equity premiums in our economy and others over the past five years does not appear to be the result of ephemeral changes in perceptions. It is presumably the result of a permanent technology-driven increase in information availability, which by definition reduces uncertainty and therefore risk premiums. This decline is most evident in equity risk premiums. It is less clear in the corporate bond market, where relative supplies of corporate and Treasury bonds and other factors we cannot easily identify have outweighed the effects of more readily available information about borrowers.

Chairman Greenspan was clearly hedging his bets in this 1999 speech. In fact a proper reading of the entire speech suggests that Chairman Greenspan's message is a cautionary one with respect to the continuing decline in the equity risk premium referred to in the above quote. In the paragraphs immediately following the above quote, which Dr. Woolridge omits. Greenspan notes that there is a divergence of opinion amongst analysts with respect to the permanency of the decline in equity premiums. He goes on to state:

> Whatever case applies, what is certain is that the question of the permanence of the decline in equity premiums is of critical importance to risk managers. They cannot be agnostic on this question because any abrupt rise

> in equity premiums must inevitably produce declines in the values of most private financial obligations. Thus, however clearly they may be able to evaluate asset-specific risk, they must be careful not to overlook the possibilities of macro risk that could undermine the value of even a seemingly well-diversified portfolio.

Given the brutal market corrections that followed his speech, the October 1999 remarks constituted sound advice. In fact, this speech supports the exact opposite of Dr. Woolridge's contention. Chairman Greenspan's remarks should have been considered in their entirety by Dr. Woolridge, as well as the ensuing market corrections. Dr. Woolridge's position on equity risk premiums is not supported either by Chairman Greenspan's speech or subsequent events in the market and should be rejected.

EMPIRICAL CAPM

Q. PLEASE COMMENT ON DR. WOOLRIDGE'S ASSESSMENT OF THE EMPIRICAL CAPM USED IN YOUR TESTIMONY.

A. On pages 66, Dr. Woolridge argues that my ECAPM is unsupported by the literature and that there are no published studies that support the ECAPM. This is incorrect, as I show below. There have been countless empirical tests of the CAPM to determine to what extent security returns and betas are related in the manner predicted by the CAPM. The results of the tests support the idea that beta is related to security returns, that the risk-return tradeoff is positive, and that the relationship is linear. The contradictory finding is that the risk-return tradeoff is not as steeply sloped as the predicted CAPM. That is, empirical research has long shown that low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted. A

CAPM-based estimate of cost of capital underestimates the return required from low-beta securities and overstates the return required from high-beta securities, based on the empirical evidence. This is one of the most well-known results in finance. A number of variations on the original CAPM theory have been proposed to explain this finding. The ECAPM makes use of these empirical findings. The ECAPM estimates the cost of capital with the equation:

$$K = R_F + \acute{\alpha} + \beta \times (MRP - \acute{\alpha})$$

where $\acute{\alpha}$ is the "alpha" of the risk-return line, a constant, and the other symbols are defined as before. Inserting the long-term risk-free rate as a proxy for the risk-free rate, an alpha in the range of 1% - 2%, and reasonable values of beta and the MRP in the above equation produces results that are indistinguishable from the ECAPM used in my testimony:

$$K = R_F + 0.25 (R_M - R_F) + 0.75 \beta (R_M - R_F)$$

I point out that an alpha range of 1% - 2% is somewhat lower than that estimated empirically. The use of a lower value for alpha leads to a lower estimate of the cost of capital for low-beta stocks such as regulated utilities. This is because the use of a long-term risk-free rate rather than a short-term risk-free rate already incorporates some of the desired effect of using the ECAPM. That is, the long-term risk-free rate version of the CAPM has a higher intercept and a flatter slope than the short-term risk-free version which has been tested. Thus, it is reasonable to apply a conservative alpha adjustment.

Contrary to Dr. Woolridge's belief that there is no support in the finance literature for the ECAPM used in my direct testimony, Table 7 below provides a

summary of the empirical evidence on the magnitude of alpha. Thus, I do not share Dr. Woolridge's view that the ECAPM is unsupported in the literature.

TABLE 7 - EMPIRICAL EVIDENCE ON THE ALPHA FACTOR IN THE ECAPM

Author	Range of alpha
Fischer (1993)[9]	-3.6% to 3.6%
Fischer, Jensen and Scholes (1972)[10]	-9.61% to 12.24%
Fama and McBeth (1972)[11]	4.08% to 9.36%
Fama and French (1992)[12]	10.08% to 13.56%
Litzenberger and Ramaswamy (1979)[13]	5.32% to 8.17%
Litzenberger, Ramaswamy and Sosin (1980)[14]	1.63% to 5.04%
Pettengill, Sundaram and Mathur (1995)[15]	4.6%

Sources:

[9]Black, Fischer, "Beta and Return," *The Journal of Portfolio Management,* Fall 1993, 8-18.

[10]Black, Fischer, Michael C. Jensen and Myron Scholes, "The Capital Asset Pricing Model: Some Empirical Tests, from Studies in the theory of Capital Markets," in Jensen, M. (ed.) *Studies in the Theory of Capital Markets,* Praeger, New York, 1972,79-121.

[11]Fama, Eugene F. and James D. MacBeth, "Risk, Returns and Equilibrium: Empirical Tests," *Journal of Political Economy,* September 1972, pp. 607-636.

[12]Fama, Eugene F. and Kenneth R. French, "The Cross-Section of Expected Stock Returns," *Journal of Finance,* Vol. 47, June 1992, pp. 427-465.

[13]Litzenberger, Robert H. and Krishna Ramaswamy, "The Effect of Personal Taxes and Dividends on Capital Asset Prices, Theory and Empirical Evidence," *Journal of Financial Economics,* June 1979, pp. 163-195.

[14]Litzenberger, Robert H. and Krishna Ramaswamy and Howard Sosin, "On the CAPM Approach to Estimation of a Public Utility's Cost of Equity Capital," *The Journal of Finance,* Vol. 35, No. 2, May 1980, pp. 369-387.

[15]Pettengill, Glenn N., Sridhar Sundaram and Ike Mathur, "The Conditional Relation between Beta and Returns," *Journal of Financial and Quantitative Analysis, Vol.* 30,No. 1, March 1995, pp. 101-116.

TAX EFFECTS

Q. PLEASE COMMENT ON DR. WOOLRIDGE'S VIEWS CONCERNING TAX EFFECTS.

A. On pages 6-7 of his testimony, Dr. Woolridge argues that following the passage of President Bush's tax reduction on dividend income from U.S. stocks, investor return requirements have decreased in response to the lower tax burden. Dr. Woolridge's argument assumes that all investors are taxable. This ignores the fact that several institutional investors are not taxable, such as pension funds and mutual funds, and they engage in very large amounts of trading on security markets. It is quite plausible that taxable retail investors are relatively inactive traders and that large non-taxable investors have a substantial influence on capital markets.

DCF GROWTH RATES

Q. PLEASE COMMENT ON DR. WOOLRIDGE'S CRITICISM OF YOUR DCF ANALYSIS.

A. On pages 74-75 of his testimony, Dr. Woolridge maligns my use of the analysts' earning growth forecast as a proxy for the growth component, and that I have ignored historical and projected growth rates in dividends and book value. I have previously discussed the impropriety of relying on "near-term" dividend growth because it is widely expected that energy utilities will continue to lower their dividend payout ratio over the next several years in response to increased business risk, and that earnings and dividends are not expected to grow at the same rate in the future. Whenever the dividend payout ratio is expected to change, the

intermediate growth rate in dividends cannot equal the long-term growth rate, because dividend/earnings growth must adjust to the changing payout ratio. In my direct testimony and earlier in my rebuttal, I discussed the merits of using consensus analysts' earnings growth forecasts in the DCF model and the supportive empirical literature.

I find Dr. Woolridge's criticism surprising, given that he himself ends up relying on Value Line forecasts and analysts' growth forecasts contained in the Yahoo, Reuters, and Zacks Web sites. He also relies on Value Line forecasts in his internal growth approach to specifying the growth component of the DCF model.

COMPARABLE GROUPS

Q. PLEASE COMMENT ON DR. WOOLRIDGE'S CRITICISM OF ONE OF YOUR COMPARABLE GROUPS OF COMPANIES.

A. On page 51 of his testimony, Dr. Woolridge argues that combination gas and electric utilities do not represent an adequate proxy for natural gas companies. I disagree. Combination gas and electric utilities possess economic characteristics similar to those of natural gas utilities. They both sell energy transmission-distribution products at regulated rates in a cyclical and weather-sensitive market. They both employ a capital intensive network. They are both regulated by public utility commissions or other utility regulators and act as suppliers of last resort. As further evidence of their comparability, regulators have allowed almost identical rates of return for both groups in the past. Moreover, Standard & Poor's now considers natural gas and electric utilities as members of an homogeneous

group, and assigns the same bond rating benchmarks to both groups. Dr. Woolridge's denunciation of my combination gas and electric utilities comparable group is unjustified and inconsistent with the investment community's perceptions on this issue.

Dr. Woolridge also takes issue with my natural gas utilities group. This is a strange criticism given that ten of the companies in my natural gas group out of a total of 14 in my DCF analysis are also in Dr. Woolridge's group.

ALLOWED RISK PREMIUMS

Q. PLEASE COMMENT ON DR. WOOLRIDGE'S CRITICISM OF YOUR ALLOWED RISK PREMIUM ANALYSIS.

A. On page 70 of his testimony, Dr. Woolridge criticizes my allowed risk premium analysis on the grounds that it is circular. I disagree with Dr. Woolridge's position that returns allowed by regulators should be disregarded, even though investors do take into account returns granted by various regulators in formulating their risk and return expectations, as evidenced by the availability of commercial publications disseminating such data. Allowed returns, while certainly not a precise indication of a particular company's cost of equity capital, are nevertheless an important determinant of investor growth perceptions and investor expected returns. Dr. Woolridge's rejection of risk premium analyses using regulatory ROE awards is undeserved.

XVIII. CONCLUSIONS

Q. WHAT DO YOU CONCLUDE FROM DR. WOOLRIDGE'S COST OF CAPITAL TESTIMONY?

A. My general conclusions are:

1. Dr. Woolridge's recommended return is completely outside the zone of currently allowed rates of return for utilities in the United States and for his own sample of companies.

2. Application of the standard DCF model to utility stocks understates the investor's expected return when the M/B ratio exceeds unity as is the case in the current capital market environment where utility stocks, including Dr. Woolridge's sample companies, are trading at M/B ratios well above unity.

3. Dr. Woolridge's dividend yield component is understated by 30 basis points because it does not allow for flotation costs, and, as a result, a legitimate expense is left unrecovered.

4. Dr. Woolridge's selection of a growth rate for each company in his comparable group is ambiguous and arbitrary. Moreover, there are errors in Dr. Woolridge's internal growth DCF analysis. Not only is there a serious element of logical circularity in his approach because he is forced to assume the answer before he conducts the analysis, but the academic literature frowns on the approach.

5. Historical growth rates have little relevance as proxies for future long-term growth in the DCF model because they are not representative of long-term earning power and because they produce unreasonably low DCF estimates.

Moreover, historical growth rates are largely redundant because such historical growth patterns are already incorporated in analysts' growth forecasts.

6. Because energy utilities are expected to lower their dividend payout ratio over the next several years in response to the gradual penetration of competition in the revenue stream, the use of dividend growth projections is inappropriate in the DCF model. Earnings growth projections are far more relevant.

7. Dr. Woolridge's views on the role of the M/B ratio in regulation are illogical and inconsistent.

8. Dr. Woolridge's estimate of the market risk premium is too low because he has erroneously employed geometric means instead of the correct arithmetic means and because he has misrepresented the literature on the issue. Use of the correct market risk premium increases Dr. Woolridge's CAPM estimate of ULH&P's cost of equity by at least 120 basis points.

9. The plain vanilla version of the CAPM used by Dr. Woolridge understates the Company's cost of equity by about 50 basis points.

10. Dr. Woolridge's recommended ROE is not reflective of the forecast increase in capital costs.

11. Dr. Woolridge's criticisms of my testimony are unfounded.

Q. DOES THIS COMPLETE YOUR REBUTTAL TESTIMONY?

A. Yes, it does.

VERIFICATION

Halifax Co.)
Province of Nova Scotia) **SS:**

The undersigned, Roger A. Morin, being duly sworn, deposes and says that he is Professor of Finance at the College of Business, Georgia State University, and Professor of Finance for Regulated Industry at the Center for the Study of Regulated Industry at Georgia State University and he has personal knowledge of the matters set forth in the foregoing testimony, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.

Roger A. Morin, Affiant

Subscribed and sworn to before me by Roger A. Morin on this 15 day of July, 2005.

NOTARY PUBLIC

My Commission Expires: N/A

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF AN ADJUSTMENT OF GAS RATES OF THE UNION LIGHT, HEAT AND POWER COMPANY	)))	CASE NO. 2005-00042

REBUTTAL TESTIMONY OF

PAUL F. OCHSNER

ON BEHALF OF

THE UNION LIGHT, HEAT AND POWER COMPANY

TABLE OF CONTENTS

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME.

A. My name is Paul F. Ochsner.

Q. ARE YOU THE SAME PAUL F. OCHSNER WHO PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY IN THIS PROCEEDING?

A. I rebut the testimony of Mr. David H. Brown Kinloch on certain cost allocation matters relating to the cost of service study. My primary purpose is to rebut Mr. Kinloch's testimony related to his proposed revenue increase distribution method. I also rebut Mr. Kinloch's testimony on issues surrounding the cost classification and allocation of uncollectible expense and mains as they relate to the customer charge calculation for this proceeding. Finally, I rebut Mr. Kinloch's testimony on the Company's method for functionalizing costs.

II. REVENUE DISTRIBUTION

Q. HOW DO YOU RESPOND TO MR. KINLOCH'S CRITICISM THAT THE COMPANY'S PROPOSED REVENUE DISTRIBUTION OF THE INCREASE IS UNREASONABLE AND INEQUITABLE TO THE RESIDENTIAL CLASS?

A. When evaluating the change in revenue responsibility by rate class at the full increase requested and using the Company's proposed methodology, WPFR-9v, Page 30 of 31, which reduces the current rate of return ("ROR") subsidy/excess

amounts by 50%, the overall increase in revenue responsibility is approximately 1.8% to the residential class. The table below provides a summary of each rate group's change in revenue responsibility as proposed by the Company.

Table 1 – CHANGE IN REVENUE RESPONSIBILITY

Rate Group	Current Revenues	Ratio	Proposed Revenues	Ratio	Percentage Change
Rate RS	**84,784,140**	**65.50%**	**96,525,004**	**67.27%**	**1.77%**
Rate GS	**41,740,022**	**32.25%**	**43,661,971**	**30.43%**	**-1.82%**
Rate FT-L	**1,916,874**	**1.48%**	**2,126,361**	**1.48%**	**0.00%**
Rate IT	**998,744**	**0.77%**	**1,174,973**	**0.82%**	**0.05%**
Total	**129,439,780**	**100.00%**	**143,488,309**	**100.00%**	

Q. CONSIDERING THE MAGNITUDE OF THE REQUESTED INCREASE, IS THE COMPANY'S PROPOSED CHANGE IN REVENUE DISTRIBUTION REASONABLE?

A. Yes.

Q. WHY DO YOU BELIEVE THAT THE ALLOCATION OF THE PROPOSED INCREASE ON CAPITALIZATION IS APPROPRIATE?

A. By using capitalization you do not impact the subsidy/excess amount under proposed rates compared to present rates. Assuming no reduction in the subsidy/excess amount all rate classes will have the same subsidy/excess percentage under present rates as they do under proposed rates. If you use present revenues to allocate the rate increase some rate classes could be further and some closer to the average rate of return. Since the goal is to move all rate classes closer to the average rate of return allocating the rate increase on capitalization will not move any rate classes further from the average rate of return.

Q. PLEASE DESCRIBE YOUR CRITICISM OF MR. KINLOCH'S PROPOSED REVENUE DISTRIBUTION METHODOLOGY?

A Mr. Kinloch's revenue distribution method is flawed because it limits the amount of the proposed increase that could be justified in order to move all rate groups equitably toward the authorized rate of return. Mr. Kinloch's proposed revenue distribution on Exhibit DHBK-15, Revised, illustrates how his method produces inequitable and unreasonable subsidy/excess rate of return reduction amounts for each of the rate groups.

Q. PLEASE DESCRIBE HOW YOU ARRIVED AT THIS CONCLUSION.

A. On page 15 of his testimony, Mr. Kinloch states that his proposed subsidy adjustment is attempting to move all classes closer to the average rate of return in the cost of service, thus reducing the subsidy/excess that exists for all customers. To test this theory, we inserted Mr. Kinloch's proposed revenue distribution numbers into the spreadsheet used for the Company's revenue distribution method. The results of this exercise indicate that all rate groups are not moving closer to the average rate of return requested in the Cost of Service Study.

Q. WHAT DO THE RESULTS OF THIS ANALYSIS INDICATE?

A. The results indicate that Mr. Kinloch's revenue distribution proposal produces results that deviate from his stated goal of moving all classes rate of return closer to the average rate of return. The results indicate that the subsidy/excess positions for Rate RS, FT-L and IT were reduced by 12.5%, 40.0% and 80.6%. The subsidy /excess position Rate GS worsened by 3.4%.

Q. HOW WOULD YOU DEFINE THE RESULTS OF MR. KINLOCH'S PROPOSED REVENUE DISTRIBUTION AS IT RELATES IN REDUCTION IN THE SUBSIDY/EXCESS POSITION FOR EACH CLASS?

A. I believe the results indicate that his method fails the test of being reasonable and equitable and ignores the principles of gradualism. His method fails the basic premise that he is moving all classes towards average rate of return, by increasing the Rate GS subsidy position, moved them farther form the average rate of return. He has failed the principle of gradualism by reducing the subsidy position of Rate IT by 80% and failed the principle of being fair by not moving all classes at the same percentage as noted above.

Q. PLEASE EXPLAIN WHY THE COMPANY'S PROPOSED REVENUE DISTRIBUTION METHODOLOGY IS THE MORE APPROPRIATE APPROACH.

A. In this proceeding, the Commission will authorize the Company to adjust net operating income levels to enable the Company to earn a reasonable rate of return on Rate Base and Capitalization Costs associated with gas service. The Company's proposed revenue distribution methodology is designed, without bias, to produce a level of revenue that equitably allocate the authorized revenue increase to each rate group so that there is consistent movement of the current rates of return toward the authorized rate of return. This methodology is consistent with that accepted by this Commission in Case No. 2001-00092. If the Commission believes the movement for a particular class is too large, the

subsidy/excess amount can be reduced to move in a more gradual manner but I believe that all classes should be moved by the same percentage.

III. COST CLASSIFICATION/ALLOCATION

Q. DO YOU AGREE WITH MR. KINLOCH'S REASONING FOR NOT INCLUDING A PORTION OF UNCOLLECTIBLE EXPENSE AS PART OF THE CUSTOMER CHARGE CALCULATION?

A. No, I do not. If a customer has an account that goes uncollected, he must be connected to the system. A portion of the uncollected bill therefore should be reflected in the customer charge calculation. I believe this logic coincides with the statement on page 17 of Mr. Kinloch's testimony, where he states: "The basis for the customer charge is that there are certain fixed costs that each customer should bear whether any gas is used at all." The Company has allocated only that portion of uncollectible expense that is classified as the distribution service customer component in the Cost of Service Study for Rates RS and GS, which includes the customer component of mains.

Q. DO YOU AGREE WITH MR. KINLOCH'S RECOMMENDATION TO EXCLUDE THE CUSTOMER COMPONENT RELATED TO MAINS WHEN CALCULATING THE CUSTOMER CHARGE?

A. No, I do not. A portion of the mains clearly falls into the customer category under NARUC's Gas Distribution Rate Design Manual because they are a fixed cost item, of which a portion or all of the cost can be directly attributable to connecting the customer to provide the opportunity to take service. NARUC also recognizes

that a component of mains be classified as customer related if the zero intercept method is used to determine the customer component.

Q. WHAT TYPE OF ALLOCATION FACTOR DOES THE COMPANY USE TO ALLOCATE MAIN COST TO THE RESPECTIVE RATE CLASSES?

A. The Company utilizes a customer/demand allocation factor to allocate mains to the rate classes.

Q. WHAT METHOD DOES THE COMPANY USE TO DETERMINE THE CUSTOMER COMPONENT OF MAINS?

A. The customer component is determined by utilizing the zero intercept method. This method assumes there is a zero or minimum size main necessary to connect the customer to the system and thus affords the customer and opportunity to take service if he so desires. In Case No. 2001-00092, the Commission accepted this method for determining the customer component associated with the cost allocation of mains. As a result, I believe the customer component of mains allocated to each rate group should be included in the customer charge calculation.

Q. HAVE YOU REVIEWED THE RESULTS OF MR. KINLOCH'S COST OF SERVICE STUDY?

A. Yes.

Q. HAS MR. KINLOCH TAKEN CONSISTENT POSITIONS IN THIS AREA OF HIS TESTIMONY?

A. No. On page 17 of his testimony, he states that the NARUC manual specifically identifies uncollectible expense as varying with the amount of gas sold, as opposed to varying with the number of customers, thus it should be recovered as

part of the commodity charge. Yet in Exhibits DHBK-16 and 18, his cost of service studies to support his customer charge calculations, Mr. Kinloch deducted only the portion of distribution service customer-related uncollectible expense associated with mains. He left the remaining amount in his customer charge calculation.

Q. DO YOU HAVE A RECOMMENDATION REGARDING THE COSTS INCLUDED MR. KINLOCH'S PROPOSED CUSTOMER CHARGE CALCULATIONS?

A. Yes. For all the reasons stated above, I recommend that the Commission reject Mr. Kinloch's proposal to eliminate all cost associated with the customer component of mains including the capitalization component, operating expenses, uncollectible expense and the associated total other operating revenues he has reflected on line 7 of Exhibits DHBK 17 and 19.

IV. FUNCTIONALIZATION OF COSTS

Q. PAGE 16 OF MR. KINLOCH'S TESTIMONY STATES THAT THE COMPANY USED AN UNORTHODOX APPROACH TO FUNCTIONALIZE COSTS FOR ITS COST OF SERVICE STUDY. DO YOU AGREE?

A. No, I do not. The total company functional cost data is listed down the left side of the spreadsheet in the Cost of Service Study, FR 10(9)v-1. The functional classification of costs follows the uniform system of accounts prescribed by FERC. The presentation of the functional data filed in this proceeding is in the same format utilized by ULH&P and its affiliated utility operating companies in

both gas and electric rate proceedings for decades. This functionalization has been expanded to include the functionalization of General and Intangible Plant, Common and Other Plant and administration and general expenses. Contrary to Mr. Kinloch's assertion, this step is performed prior to the allocation to rate classes as shown in the costs of service study, FR 10(9)v-1.

The format used for the individual rate class studies, FR 10(9)v-1 through FR 10(9)v-5, which classifies these functional costs as either production demand and/or commodity, distribution demand and/or customer, is the same as that used in Case No. 2001-00092. Again, the functional data to be assigned to the above listed classifications is listed down the left column and match the Cost of Service Study.

Q. DO YOU BELIEVE THAT THE METHODOLOGY WHICH ULH&P USED TO FUNCTIONALIZE COSTS FOR ITS COST OF SERVICE STUDY IS FUNDAMENTALLY AND TECHNICALLY SOUND?

A. Yes. I believe Mr. Kinloch's criticism of the methodology is unfounded. My response to KyPSC-DR-02-096 further explains the methodology and that it follows traditional cost of service study steps.

Q. DO YOU AGREE WITH MR. KINLOCH THAT THERE IS A PROBLEM WITH THE COMPANY'S ALLOCATION OF THE RATE INCREASE?

A. No, I do not.

Q. WHY DO YOU HOLD THIS OPINION?

A. Mr. Kinloch has two main criticisms of the Company's revenue distribution methodology. At page 14, his testimony states: the results of the methodology are

not reasonable and unfair because the starting point is capitalization instead of present revenues. Yet, Mr. Kinloch fails to provide a technical explanation as to why the use of capitalization to allocate the proposed increase is inappropriate. He proposes that present revenues should be the starting point for developing the Company's proposed revenue distribution calculation but fails to explain why this method is more appropriate.

His real objection to the proposed revenue increase is that it does not follow along the lines of current revenue distribution and that the Company's proposed increase moves the rate classes closer to the average rate of return in a more equitable fashion than he would prefer. I will address both issues below.

II. CONCLUSION

Q. DOES THIS COMPLETE YOUR PRE-FILED REBUTTAL TESTIMONY?

A. Yes.

VERIFICATION

State of Ohio)
) **SS:**
County of Hamilton)

The undersigned, Paul F. Ochsner, being duly sworn, deposes and says that he is a Rate Coordinator for Cinergy Services, Inc, that he has personal knowledge of the matters set forth in the foregoing testimony, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.

Paul F. Ochsner

Paul F. Ochsner, Affiant

Subscribed and sworn to before me by Paul F. Ochsner on this 14th day of July, 2005.

Anita M. Schafer

NOTARY PUBLIC

My Commission Expires:

NOTARY PUBLIC STATE OF OHIO

ANITA M. SCHAFER
Notary Public, State of Ohio
My Commission Expires
November 4, 2009