further depresses the price.

The theoretical basis for the conclusion just stated has been fully developed,[1] but a simple analogy goes a long way in demonstrating the point. Ignoring operating costs, a bank that borrows at 8% and lends at 10% adds 2% of the amount borrowed and loaned to the earnings of the bank's shareholders. The more the bank borrows and lends with this 2% spread, the more it increases future earnings on and the current value of its common stock. The return that investors require on a utility's common stock is, in one form or another, what must be paid for additional equity funds, and if the company earns more on the money than it must pay to get the funds, the excess adds to the earnings on and value of the existing shares. Conversely, if the company earns a lower rate of return than it pays on additional funds, the difference comes out of the pockets of the existing shareholders.

While the management of a utility may not be able to prevent a regulatory agency from allowing it a rate of return on capital below its costs of capital, it will, quite understandably, be reluctant to compound the mis-

---

[1] For an extensive discussion, see M.J. Gordon, The Cost of Capital to a Public Utility, Michigan State University, East Lansing, Michigan, 1974.

equity are the same as those used in measuring the yield which investors require on debt or the yield required on outstanding preferred stock. However, in the case of debt and preferred stock, the payments to investors are relatively certain and, thus, amenable to objective calculation. However, the future dividend payments on a share of stock are uncertain, and determination of the expected yield required by investors requires the use of a more complex, yet still relatively simple and very reliable, method for dealing with the problem at hand.

This method is called the DCF (Discounted Cash Flow) Method for computing the cost of equity capital.[1] It represents the valuation of a share of stock by the expression:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_t}{(1+k)^t} + \ldots + \frac{D_\infty}{(1+k)^\infty} . \qquad (1)$$

In this expression:

P_0 = the current price per share;

D_t = the expected value of the dividend the share will pay at the end of period t; and

k = the yield or return investors require on the share.

---

[1] This method was developed by Myron J. Gordon in an article in Management Science in 1956 and was first introduced in testimony in the American Telephone and Telegraph Co. Case, F.C.C. Docket 16258, 1966.

If the future dividends are expected to grow at the rate of g each period, Equation (1) reduces to:

$$P_0 = \frac{D_1}{k-g} \qquad (2)$$

Solving Equation (2) for k results in an expression for the yield that investors require:

$$k = \frac{D_1}{P_0} + g. \qquad (3)$$

In other words, to measure the expected return that investors require we may take the sums of the dividend yield and the expected rate of growth in the dividend.

An alternate approach to Equation (1) for the price of a share is:

$$P_0 = \frac{D_1 + P_1}{1 + k}. \qquad (4)$$

Here, we take as the future payments the next period's dividend and the end-of-period price. However, $P_1=P_0(1+g)$, and this substitution plus a little algebra results in Equation (2). Hence, the two approaches to share valuation result in the same measurement equation for share yield.

In order to use Equation (3), we need to measure both

the dividend yield and the expected rate of growth in the dividend.

1. Measurement of Dividend Yield

The term for dividend yield in the Eq. (3) expression for a share's yield is the forecast dividend for the coming period, D_1, divided by the current price, P_0. The value assigned to P_0 should be the price of the share at the time the share yield is being estimated. The rationale for using the current price is that at each point in time it reflects all the information available to a company's investors regarding future dividends. Hence, the yield investors require on any date is the discount rate that equates on that date the current price and the expected stream of future dividends. To use an average of share prices over some prior time period for P_0 would result in a value for k without meaning, that is, it would not provide the average value for k over the prior time period. Furthermore, to obtain an average value for k over some prior time period, one must average the values of share yield -- not of share price.

D_1 is the forecast dividend for the coming year if dividends are paid annually. Common practice, however, is to pay dividends quarterly, in which case D_t in Eq. (1), the fundamental expression for share price, is a quarterly

dividend. The value of k that satisfies Eq. (1) is the quarterly yield on the share, and the g in Eqs. (2) and (3) is the quarterly rate at which the dividend is expected to grow.

Because it is customary and convenient to think in terms of annual and not quarterly figures for rate of return and growth statistics, annualized figures will be used here. Annualized figures are simply four times quarterly figures. That is, if the current price of a share is P_0=$50.000, and if its forecast dividend for the coming quarter is D_1=$1.25, the quarterly dividend yield is $1.25/$50.00=2.5%, and the annualized dividend yield is 10%.

We all know from bank advertisements that when interest is compounded more frequently than once a year, two annual interest rates may be computed. To illustrate, an interest rate of 15% per year with the interest compounded quarterly means that a dollar left on deposit for a year will have 3.75% added to the balance at the end of each quarter, and the balance in the account at the end of the year will be $1.1587. In other words, a 15% interest rate compounded quarterly will earn interest equal to 15.87% of the balance at the start of the year.

What does this imply for arriving at a rate of return equal to the cost of equity capital? If the quarterly yield at which a public utility share sells is 3.75%, should the utility be allowed to earn for the year a rate of return on

common equity of 15% or something more? The answer is: (1) more than 15%, if the rate of return the company earns is calculated on the basis of the common equity at the start of the year; and (2) only 15%, if the rate of return on common equity is calculated by averaging its values at the start and at the end of the year. This statement is proved in Schedule 27. The latter method represents common practice and the practice followed here. Hence, in arriving at the cost of equity capital, the correct figure for the dividend-yield term in Eq. (3) is the annualized value of the forecast dividend for the coming quarter divided by the current price.

2. Measurement of Expected Growth

A difficult problem is the determination of the long-run dividend growth expectations of investors. In other words, what is the expected rate of growth in future dividends per share, g, in which investors on average believe?

To solve the problem, it is essential to understand the determinants of long-run expected dividend growth. If a company is expected to earn a rate of return of r on its common equity, and if it retains the fraction b of its earnings, then each year its earnings per share can be expected to increase by the fraction br of its earnings per share in

the previous year. Thus, br is an excellent measure of the expected rate of growth in future earnings per share. If the company is expected to have a stable retention ratio and, therefore, a stable dividend payout ratio, it follows that br is also an excellent measure of the expected rate of growth in future dividends per share. That is:

$$g = br. \tag{5}$$

This relationship is illustrated in Schedule 18. There the hypothetical initial common equity or book value per share = $10.00, r = .10 and b = .4. The first period earnings are expected to be $1.00 per share and the expected dividend is $.60. The retained earnings raise the book value of equity to $10.40 at the start of the second year, and r times that is $1.04, which is equal to the earnings per share the second year. The dividend in the second year is expected to be $.624, and so on through time. The earnings, dividends, and stock price are expected to grow at the rate br = (.4) (.10) = .04 in every future year.

If investors require an 8% return on the stock, the initial price is:

$$P_0 = \frac{D_1}{k-g} = \frac{\$.60}{.08-.04} = \$15.00. \tag{6}$$

Similarly, the expected share price after one year is:

$$P_1 = \frac{D_2}{k-g} = \frac{\$.624}{.08-.04} = \$15.60 \qquad (7)$$

The price in subsequent periods rises by 4% as long as the yield investors require on the share remains equal to 8%.

In fact, a company's return and retention rates do not remain constant over time. However, if investors expect that a company will on average earn a return of r and retain the fraction b of its earnings, they will expect the dividends, earnings, and price to grow at a rate br due to retention of earnings.

Stock financing will be a further cause of expected growth if the company is expected to issue new shares and if the stock's market price is greater than book value. Conversely, when a company is expected to engage in stock financing through the sale of stock at share prices below book value, ignoring the stock financing results in an overestimate of growth and share yield. If the company is expected to engage in little or no stock financing, or if stock financing is expected to occur only when the market value is close to book value, the expected rate of growth in the earnings, dividends, and price per share is g = br. As will be shown later, we may ignore stock financing and only consider growth due to retention of earnings.

If two conditions are satisfied, the best estimate of g is obtained either from the company's current values of b and r or from weighted averages of their recent values. These two conditions are: stock financing may be ignored for either of the reasons stated above, and there is no information other than the past values of b and r which can be used to forecast their future values.

The sharp rise in energy prices and other costs over the past decade have had a disruptive influence on the electric utility industry, and they have created situations in which there are obvious reasons why past values of b and r should not be projected into the future. In two recent cases, the DCF formula was adapted to deal with the peculiar circumstances of each case.[1] Similarly, as will be shown below, the recent dramatic change in anticipated inflation provides information which should be used to modify the past values of b and r in order to obtain a more accurate forecast of expected growth.

3. Alternative Measures of Expected Growth

It might be thought that past rates of growth in

---

1 Testimony of Myron J. Gordon, Boston Edison Company Case No. DPU 19300, Commonwealth of Massachusetts, Department of Public Utilities, 1977; and Testimony of Myron J. Gordon, Public Service Company of New Mexico Case No. 1419, New Mexico Public Service Commission, 1979.

either earnings, dividends, or price could be used as estimates of g, the forecast rate of future growth in dividends. However, these past rates of growth are most unreliable due to extraneous influences on them, such as changes in the rate of return on common equity, changes in the retention rate, or changes in the yield required by investors in the case of price changes. The potential error in using past growth in earnings to estimate g is illustrated in Schedule 19, where the hypothetical company's return on common equity is 10% in the first three periods and 15% in the last three periods. With a retention rate of 40% and a return rate of 15% the growth rate is 6% in the last three years. This is a reasonable estimate of the expected future growth rate as of the end of the 6th year. However, with the 36% growth rate due to the rise in the return rate in the fourth year, a simple average of the five annual past growth rates in earnings is in excess of 15%. Clearly, this type of estimate of future growth rates cannot be used with any reliability at all, especially now when public utilities have received frequent upward adjustments in their allowed rates of return over the past five years. To do so would be to expect the company's rate of return on common equity to increase by 50% about every five years. This would be a ridiculous forecast, which the use of b and r would make readily apparent.

It can also be demonstrated that a change in the dividend payout rate makes the past rate of growth in dividends an incorrect basis for predicting g. Assume that a company has been earning a rate of return on its common stock of r = .10, that it has been retaining the fraction b = .60 of its earnings, and that, as a consequence, its dividend has been growing at the rate br = (.60)(.10) = .06. If the company were to raise the fraction of earnings it pays in dividends so that b falls to .25, the rate of growth in the dividend would then fall to br = (.25) (.10) = .025. However, over the period that spans the rise in the dividend payout rate, the dividend would have grown at an even higher rate than the prior 6%. It would only be correct to project the past rate of growth in the dividend into the future on the highly implausible assumption that the company is expected periodically to raise its payout rate. Therefore, unless there is convincing evidence to the contrary, <u>current expectations of b and r provide the best basis for forecasting future growth.</u>

C. Cost of Equity Capital for AT&T

Under the method we have advocated for estimating future growth, the DCF formula for a company's cost of equity capital is:

$$k = \frac{D_1}{P_0} + br. \qquad (8)$$

To arrive at a company's current value of k, the current value of each of the quantities on the right-hand side of Equation (8) must be determined. This is done below for AT&T. As we will see, obtaining estimates of these values is extremely difficult in the turbulence of today's capital markets.

1. Dividend Yield

We argued above that the projected dividend yield is appropriate for setting the allowed rate of return on equity. The current quarterly dividend payable on April 1, 1980, is $1.25. The Value Line forecast for dividends over the next 12 months has been reduced from $5.20 in June, 1979, to a current forecast of $5.00.[1] Value Line reduced its forecast dividend even though it was aware of AT&T's stated intent to maintain shareholders real dividend income against inflation.[2] For the last few years AT&T has followed a policy of raising its dividend in the first quarter. With the recent declaration of the dividend to be paid on April 1, 1980 maintained at $1.25.

---

[1] Value Line, March 13, 1980.

[2] Value Line, February 1, 1980.

yield rose steadily from 8.99% on June 30, 1979, to the current projected yield of 10.31%. This was due mainly to the effects of its dropping share price, but also to the reduction in its projected dividend from $5.20 to $5.00.

Through their impact on the dividend yield, the date and the share price used to arrive at AT&T's cost of equity capital have a material impact on the value obtained for k. In other words, in a period over which interest rates fluctuate widely, share prices and the cost of equity capital also fluctuate widely. At the time this testimony was prepared, the reaction to President Carter's anti-inflation program was unknown. Although our estimated dividend yield of 10.31% represents our best estimate at this time, the unfolding reaction to the President's program may cause AT&T's dividend yield to vary considerably over the next few months.

2. Growth Rate - Past Financial Data

In order to arrive at AT&T's growth rate, we require the retention rate, b, and the rate of return on common equity, r, that investors may reasonably expect.

As a first step, let us estimate b and r using only historical data. Schedule 21 shows the underlying data for the years 1975 to 1979 that is needed to calculate b and r.

For the rate of return on common equity that investors expect, we first not that a simple average of the

five values of r_t (row 5) from 1975 to 1979 is 11.81%. However, inspection of the annual values reveal that although r was abnormally depressed in 1975, its values for the next three years exhibited a definite upward trend, and then only declined slightly in 1979. Investors now might well believe that the material rise in the cost of capital between 1975 and 1979 justifies the rates of return the company realized in the more recent years, in which case they would rely primarily on the 1978 and 1979 figures in forecasting the company's future rate of return. A simple average of these figures is 13.05% and it seems reasonable that investors might conclude that 13% represents the best estimate of the long-term return AT&T is expected to earn on common equity.

For the retention rate that investors expect, we first note that a simple average of the five values of b_t (row 9) from 1975 to 1979 is 37.23%. However, this average is affected by the low retention rate in 1975, and in recent years, 1977-1979, the retention rate has averaged 38.93%. It seems reasonable that on the basis of this data, investors might use these recent years, and arrive at 39% as the best estimate of AT&T's retention ratio.

Combining the above values (obtained by using historical values in Equation (8) for P_0, D_1, b, and r) provides an estimate of AT&T's cost of equity capital as of March 28,

1980, of:

$$k = \frac{D_1}{P_o} + br$$

$$= \frac{\$\ 5.00}{\$48.50} + (.39)(.13)$$

$$= .1031 + .0507 = 15.38\% .$$

However, before accepting this result it may be instructive to pose the following question: What would have been the estimate for k as of June 30, 1979?

3. Growth Rate - Recent Developments

On June 30, 1979, Value Line estimated that AT&T's 1979 earnings would be $8.00 per share. The actual value of earnings per share for 1979 was $8.04. Since we would have been reluctant to estimate k at that time without 1979 data, we would have relied on the Value Line forecast to complete the 1979 annual data, a procedure we have used in the past. Since the Value Line estimates were extremely close to the actual 1979 results, using these estimates and the historical data would have produced the same estimates of b and r obtained previously. It is obvious that if the data and analysis do not change materially, we would obtain the same measurement of the growth rate at any point between June 30, 1979, and March 28, 1980.

The estimates which would have been obtained on two previous dates are provided below:

Date	D_1/P_0	+ br	= k
June 30, 1979	8.99%	5.07%	14.06%
November 19, 1979	9.39%	5.07%	14.46%

An estimate is provided for November 19, 1979, for comparative purposes, since an estimate of k was obtained for Rochester Telephone Co. on that date of 14.85%.[1] The difference in k between Rochester Telephone and AT&T may be attributed to AT&T's slightly lower business risk due to its greater diversification.

The problem can now be easily seen. The estimate of 15.38% obtained for AT&T is correct only if we assume that the large increase in the expected rate of inflation (which raised the dividend yield on AT&T from 8.99% on June 30, 1979, to 10.31% on March 28, 1980) had no effect on the anticipated growth in the dividend.

It is extremely unlikely that investors believe that to be true. The rise in the expected rate of inflation has not only increased interest rates, but also the expected rate at which AT&T's other costs of production, such as materials and labor, will grow. A continued expectation that the company will earn a return on common of 13% and retain 39% of earnings would require the belief that the rate of growth in its revenues will rise to match

---

[1] Myron J. Gordon, Direct Testimony, Before the State of New York Public Utility Commission, In the Matter of Rochester Telephone Co., November 20, 1979.

the rise in the rate of growth of its costs. However, if investors fear that the regulatory process will not be fully responsive to the increase in the rate at which the company's costs are rising, they will revise their growth estimate downward. That is, with any regulatory lag in the pass through of higher costs, a rise in the expected inflation rate would reduce investor estimates of long-run return on common equity, and would, therefore, result in a downward revision of expected growth. In that event, simply raising the estimate of AT&T's cost of equity capital by the increase in the dividend yield would result in an overstatement of the required return.

It is our judgment that the response of investors to the rise in the expected rate of inflation has been a downward revision in expectations regarding AT&T's rate of return on common equity, implying a downward revision in its retention rate also. In support of this position, we note that Value Line lowered its prediction of 1980 earnings per share for AT&T to $7.50, and lowered its predicted 1980 dividend per share to $5.00.[1] This implies for 1980 an estimate for r of 11.60% and an estimate for b of 33.33%.

Under the present turbulent economic conditions it is extremely difficult to estimate with precision the extent

---

[1] Value Line, February 1, 1980.

to which these rates have been revised downward. If the revised figures are a 12.50% return on common equity and a 37% retention rate, then the estimated growth rate must be reduced from 5.07% to 4.63%.[1] Adding the latter figure to the current dividend yield of 10.31% results in a cost of equity capital of 14.94%. On the other hand, the rise in interest rates over the past six months may be taken as evidence that the cost of equity capital has gone up over the same time period. Hence, in some measure, this rise in interest rates will lead to an upward revision in the rates of return allowed by the numerous regulatory commissions that set rates for AT&T. A generous allowance for the favorable impact of increases in the allowed rates of return on investor forecasts of the AT&T growth rate is a rise in its value from the above 4.63% to 5.25%. This latter growth rate combined with the 10.31% dividend yield results in a cost of equity capital of 15.56%. In our judgment the AT&T cost of equity capital may well be as low as 15.0%, it is most unlikely to be above 15.5%, and 15.25% represents our best estimate as of March 28, 1980.

---

[1] Using this reasoning, the growth rate was adjusted downward by 69 basis points for Rochester Telephone. Ibid., Supplemental Prepared Direct Testimony, March 24, 1980.

DCF Dividend Yield Requirement

This schedule demonstrates the impact of applying an equity cost rate derived from the Discounted Cash Flow (DCF) model to a forecasted or end-of-test-year rate base. This is demonstrated using a simple numerical example.

Consider a firm with no debt and a market-to-book ratio of 1.0. This hypothetical firm has a book value and market price equal to $20 per share. The firm's most recent quarterly dividend was $.50 which results in a spot dividend yield of 10%. The shareholders anticipate that book value, market value, earnings per share, and dividends per share are to grow at 5% per year. Thus, over the next year investors anticipate receiving:

$$E(R) = D_1+D_2+D_3+D_4 + 5\% * (\$20)$$

where:

E(R) = shareholders' expected return

D_N = quarterly dividends which are expected to grow quarterly and at an annual rate of 5%.

Therefore,

$$D_t = \$.50(1+G)'/4$$

where:

Do=$.50, D_1=$.506,D_2=$.512, D_3=$.519, and D_4=$.525.

Thus, shareholders expect to receive four quarterly dividends (all of which are greater than the recent $.50 dividend) and an increase in market value from $20 to $21 (which reflects 5% annual growth). If the firm is able to increase book value by $1 and meet all four dividend payments, then the shareholders will earn the expected rate of return. The key question is what rate of return, k, must the firm earn on year-end book value to meet the shareholders' expectations. This value of k, detailed below, is the correct cost of common equity to be employed in the case.

Firm's earnings = shareholders' expectations

k (year-end book value) = dividends + growth

k ($21.00) = $.506 + $.512 + $.519 + $.525 +5% * ($20.00)

k = (($.506 + $.512 + $.519 + $.525)/$21.00) + ($1.00/$21.00)

k = $2.062/$21 + $1.00/$21.00 k = 9.82% + 4.76% = 14.58%

The dividend yield on the left, 9.82%, is less than 10% which is the spot dividend yield. In addition, the growth rate of 4.76% works out to be less than the 5% expected growth rate which is employed in the DCF model.

To summarize, this schedule demonstrates that both the spot dividend yield and the expected growth rate in the DCF model are overstated, with a resulting overstated cost of equity capital estimate, when the cost rate of equity capital is applied to the end-of-test-year rate base of a utility. Therefore, when the overall fair rate of return is applied to an end-of-test year rate base, the dividend yield and the expected or forecasted growth are overstated.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responding: Dr. J. Randall Woolridge

33. Refer to the Woolridge Direct Testimony, Exhibit JRW-7.
    a. Provide an explanation of "Earnings," "Dividends," and "Book Value" included in Panel A on page 3 of 4 on Exhibit JRW-7. Include in the explanation a detailed description of how each component is generated, what each component means, how each component relates to the other (both computationally and behaviorally), and a graph of each component using quarterly data for the last 10 years.
    b. Provide the derivation of the 3 percent "Average of Mean and Median Figures" on Panel A and explain what this average actually measures.
    c. Explain further why one half of the Discounted Cash Flow ("DCF") Growth Rate is used to adjust the dividend yield.
    d. Explain in detail what factors analysts producing these forecasts consider in projecting growth rates Earnings per Share ("EPS"), Dividends per Share ("DPS"), and Book Value per Share ("BVPS") included in Panel B.

Response:

a. There is no Panel A on page 4 of Exhibit_(JRW-7). On Panel A of page 3, All figures come from the Value Line Investment Survey. Value Line provides the following definitions

Earnings Per Share—net profits attributable to each common share as originally reported by the company, but adjusted for all subsequent stock splits and stock dividends; may be based on weighted average shares outstanding (Basic EPS) or weighted average shares including all shares reserved for conversion of convertible securities (Diluted EPS).
Dividends Paid Per Share—the common dividends per share paid (but not necessarily declared) during the calendar year.
Book Value Per Share—net worth (including intangible assets), less preferred stock at liquidating or redemption value, divided by common shares outstanding.

Value Line provides the following definition of its growth rate methodology:

Growth Rates – Compounded annual rates of change per share for sales, "cash flow," earnings, dividends, book value (or other per share statistics) over the past 5-year or 10-year periods. Base periods used in computation are three-year averages, to temper cyclically. For example, base periods for most recent 5-year

growth rate calculation through the end of 1992 are 1990-92 versus 1985-87; base periods for 10-year growth rate are 1990-92 versus 1980-82. If one of the three year base periods is negative, the growth rate is not meaningful and appears as 9999's. Appropriate share growth rates are presented for the non-standard industries

Dr. Woolridge did not analyze quarterly data over the past ten years in preparing his testimony, and does not have access to data.

b. The 3.0% is the average of the 5-year and 10-year mean and median figures for the group for EPS, DPS, and BVPS growth rates. Dr. Woolridge uses this to get a measure of central tendency for the growth rate figures.

c. See PSC-I-33A – DCF Dividend Yield Requirement provided on CD.

d. Value Line is known to use a system in which projections are made for the economy and industries. Within this context, analysts who cover individual stocks within industries evaluate company performance and project provide their projections for EPS, DPS, and BVPS. Value Line provides the following description of theimethodology.

This publication is backed by an **independent research staff** of more than **70 experienced independent professional security analysts** No other service offers so much information in such a concise format.

- A unique and extraordinarily powerful component of The Value Line Investment Survey is its **Timeliness Ranking System**.

This proprietary system has a proven record for forecasting the next six to 12 months of relative price performance for the stocks featured in *The Value Line Investment Survey.* Over a 37 year period Value Line's **Timeliness Ranking System** has accurately anticipated stocks' subsequent relative price performance.

- An investor who purchased all stocks rated #1 by Value Line at the start of each year since 1965 and sold them at the end of each year would **have seen his/her investments appreciate more than 14,000% through June 30, 2002!**

Every week, the **Ranking System** screens millions of data items and, using a proprietary series of calculations, ranks each of the approximately 1,700 stocks for probable performance relative to each other during the next six to 12 months. This **Timeliness Ranking System** provides the basis for the stock ranks in *The Value Line Investment Survey.*

Witness Responding: Dr. J. Randall Woolridge

In addition to its invaluable **Timeliness** ranks, *The Value Line Investment Survey* provides investors with an extraordinary wealth of vital information, including among many others:

- Safety and Technical ranks for approximately 1,700 stocks.
- 3-5 Year Growth Projections for all stocks.
- Powerful investment screens listing criteria such as Timely Stocks in Timely Industries, Untimely Stocks, and High Growth Stocks.
- A separate section called Selection & Opinion, which covers topics such as Business and Stock Market prospects and includes sample portfolios for different types of investors.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responding: Dr. J. Randall Woolridge

34. Refer to the Woolridge Direct Testimony, page 25. Provide a detailed explanation of the role the internal growth figure played in determining the expected growth rate range of 4.0-4.5 percent.

Response:

Internal growth, which is calculated as the earnings retention rate times ROE, is one of the measures considered by Dr. Woolridge in assessing prospective growth. For the group, the average of the mean and median figures is 4.1%, which is within the range employed by Dr. Woolridge in arriving at his DCF growth rate.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responding: Dr. J. Randall Woolridge

35. Refer to the Woolridge Direct Testimony, Exhibit JRW-7, page 4 of 4. Provide the time period for each of the projections and demonstrate that they correspond to those provided by *Value Line.*

Response:

The time period for these projections is generally 3-5 years. Value Line's projections are for the period 2001-2003 until 2008-2010. As noted in response to PSC-33 (c), Value Line uses a 3-year moving average in computing growth.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responding: Dr. J. Randall Woolridge

36. Refer to the Woolridge Direct Testimony, page 25. Provide a more detailed explanation of the derivation of the expected growth range of 4.0-4.5 percent.

Response:

The growth rate range is from 3.0% (for historic DPS, EPS, and BVPS growth) to 4.6% (for analysts' projected EPS growth). Value Line's projected DPS, EPS, and BVPS growth is 4.3%, and prospective internal growth is 4.1%. Giving more weight to projected EPS growth, yet recognizing the known bias in analysts' EPS forecasts, leads to the 4.0-4.5 percent range.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responding: Dr. J. Randall Woolridge

37. Explain and document the advantages and disadvantages of using EPS, DPS and BVPS individually as a basis for estimating a company's cost of equity.

Response:

In theory, according to the DCF, DPS, EPS, and BVPS all are expected to grow at the same rate. However, in practice DPS, EPS, and BVPS tend to grow at different rates over different periods of time. One advantage is that DPS and BVPS tend to grow at more stable and predictable rates than EPS. However, investors tend to focus on EPS growth, and growth in DPS and BVPS does come from growth in EPS. The disadvantage of EPS growth is that it tends to be more variable over time.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responding: Dr. J. Randall Woolridge

38. Explain why it is meaningful to blend together projected growth rates EPS, DPS, BVPS for use in the DCF model and why this is an acceptable measure of the projected growth rate of dividend yield.

Response:

As discussed in response to PSC-I-37, according to the DCF model, DPS, EPS, and BVPS all are expected to grow at the same rate over a very long period of time. As such, proper application of the DCF model requires that growth in all three be considered.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responding: Dr. J. Randall Woolridge

39. Refer to the Woolridge Direct Testimony, page 47 and Exhibit JRW-3.
    a. For each of the companies listed in Exhibit JRW-3, provide the regulated and non-regulated net incomes.
    b. Provide the date of the latest rate case and the latest awarded ROE for gas operations for each of the companies.

Response:

a. Dr. Woolridge does not have the regulated and non-regulated net incomes for the companies in the group and did not use that data.

b. See 'Allowed ROE' data provided in CA Turner Utility Reports for May, 2005, as provided in response to PSC-I-26.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responding: Dr. J. Randall Woolridge

40. Refer to the Woolridge Direct Testimony, Exhibit JRW-8, page 5 of 5. Explain why an inflation measure designed to measure price changes of the weighted goods and services consumed by an average family is appropriate to use as a deflator of the average nominal EPS realized by companies that make up the S&P 500 index.

Response:

The CPI measures the increase in the prices of goods and services produced and consumed in the US. The earnings of companies comes from the production and consumption of these goods and services. In addition, the CPI is the most recognized measure of inflation in the economy.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responding: Dr. J. Randall Woolridge

41. Refer to the Woolridge Direct Testimony, Exhibit JRW-4, page 1 of 2. The AG's recommended cost rate for long-term debt of 5.926 percent does not appear in ULH&P's response to the Commission Staff's Second Data Request dated April 5, 2005, Item 21, page 39 of 40. Provide the source of the proposed cost rate.

Response:

Schedule J-3, page 2 shows that the Company's proposed embedded cost of long term debt for the forecasted period of 6.302% incorporates a cost rate of 6.77% for the $73.3 million Inter-Company Note. However, in its responses to PSC-3-9 and PSC-3-16, the Company concedes that this cost rate should be changed to 5.50%. The overall embedded cost of long term debt with the 5.50% rate rather than the 6.77% rate provides a revised overall cost of long term debt of 5.926%.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responsible: David H. Brown Kinloch

42. Refer to the Testimony of David H. Brown Kinloch ("Kinloch Testimony"), pages 6, 10, and 11 and Exhibits DHBK-6 through DHBK-9.

a. Explain why Mr. Kinloch proposes a growth rate based on just 2 years to project volumes for the Firm Transportation ("FT") class when, in developing weather normalized sales volumes, he states that "use of a short period ... creates unnecessary problems."

ANSWER:

The growth rate was based on the growth in the FT class between the two most recent years 2003 and 2004. Use of this single growth rate was done to be consistent with the Companies methodology where it used a single growth rate between one year and the next (see Company's Response to AG-DR-01-130, Attachment page 1 of 2). The difference is that the Company selected the period during the recession, between 2001 and 2002, while I simply use the most recent year to year growth rate.

With respect to weather normalization, I used a methodology that was consistent with the Commission's prior Order's where a 30-year normalization period was accepted.

b. If, as stated on page 10 of the Kinloch Testimony, prior changes in FT volumes indicate that the FT class has simply responded to economic conditions, is it appropriate to make an adjustment based solely on increases in volumes experienced since the end of the recession to which Mr. Kinloch refers? Explain the response.

ANSWER:

As mentioned in my response to part (a) above, the growth rate I used was based simply on the most recent growth rate, to be consistent with the company's methodology. Had I used the increase since the end of the recession, there would have been two years of growth to average, 15.32% for 2004 and 9.08% for 2004. Had I averaged these two years since the end of the recession, the growth rate would have been 12.2%. Since I had data from 2000 through 2004 (from ULH&P Schedule I-5, Page 1 of 1), if I had simply averaged the non-recession growth rates, (2001, 2003 & 2004), the average growth rate would have been 10.98%. The 9.08% used from 2004, is in the same range as the 2001 growth rate, while 2002 is low because of the recession, and 2003 is high as a result of a snap-back from the recession. The 2004 figure is thus more reflective of normal growth, that would be expected in the future.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responsible: David H. Brown Kinloch

43. Refer to the Kinloch Testimony, page 14. Mr. Kinloch proposes using revenues to allocate the proposed revenue increase among rate classes. Provide the rationale for using revenues rather than capitalization, which is proposed by ULH&P.

ANSWER:

As stated in my testimony, if class returns were completely equalized using capitalization, the Residential class would receive 108%* of the total rate increase awarded by the Commission. As a result, some classes would actually receive a rate decrease while others received an increase. I believe that this is inconsistent with the principle of continuity and gradualism. Under no circumstance should a rate class receive a rate decrease while others are receiving more than 100% of the total increase. When this type of methodology is employed, as the Company has done, moving half way to this point will result in a single class not receiving over 100% of the total increase, but close to 100% (90%, see Exhibit DHBK-14).

Using the Residential class as an example, using capitalization as a starting point, 77.2% of any increase will be allocated to this class. This compares to, in reality, the Residential class only pays 65% of total revenues. The starting point should be the revenues presently collected from each class, since the present revenues collected from each class is the basis for calculating the present class rates of return before the increase. Then from this present actual starting point, total revenues, adjustments can then be made to bring class returns closer together.

*Please note that while my testimony used a figure of 120%, the correct figure is 108%, as is calculated in the Attorney General's response to ULH&P's Information Request, Question 94.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responsible: David H. Brown Kinloch

44. Refer to the Kinloch Testimony, page 15. Provide the calculations of the percentages in the column headed "AG Recommendation."

ANSWER:

The requested calculations are contained in Exhibit DHBK-15. The figures referred to on page 15 of my testimony are taken from Column (J) in Exhibit DHBK-15. Figures in Column (J) are the Proposed Rate Increases by class in Column (I), divided by the total increase at the bottom of Column (I). Please see the Attorney General's response to ULH&P Information Request, Question 96, where a revised Exhibit DHBK-15 has been provided.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responsible: David H. Brown Kinloch

45. Refer to the Kinloch Testimony, page 17. Provide the specific language (and the citation) on uncollectibles contained in the National Association of Regulatory Utility Commissioners Gas Rate Design Manual.

ANSWER:

The quote from page 12 of the NARUC Gas Distribution Rate Design Manual, included on page 17 of my testimony, includes "administrative costs of servicing the account". Uncollectibles are not a part of a specific customer's account, especially since most customers pay their bills on time. Uncollectibles are thus not associated with the servicing of an individual customer account, but are more a general cost of doing business. This is specifically noted in the NARUC Electric Utility Cost Allocation Manual, on page 103, under the heading "Customer Account Expenses (Accounts 901-905)", which states:

> A. Customer Account Expenses (Accounts 901-905)
>
> These accounts are generally classified as customer-related. The exception may be Account 904, Uncollectible Accounts, which may be directly assigned to customer classes. Some analysts prefer to regard uncollectible accounts as a general cost of performing business by the utility, and would classify and allocate these costs based upon an overall allocation scheme, such as class revenue responsibility."

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Witness Responsible: David H. Brown Kinloch

46. Refer to the Kinloch Testimony, pages 21 and 22.

a. Mr. Kinloch states, "The larger the Reconnection fee, the more difficult it is for families to reconnect." Provide any evidence, studies, etc. that show the percentage of families who reconnect after being disconnected in ULH&P's service territory.

ANSWER:

When reference was made to the Reconnection fee making it "more difficult", the impact can be not only on how many families get reconnected, but also how long it takes the family to get reconnected. The higher the fees, the more money a family must pull together from assistance agencies and other sources. Since most agencies are limited in the amount of assistance they can give to any single family, the higher the fee, the more sources of assistance is required. With higher fees, it will take longer to pull together all funds needed for reconnection. The longer it takes, the longer the family must live without utility services, which creates extreme hardships on these families.

While I have no specific studies with respect to ULH&P reconnects, I do have extensive experiences working with similar families being served by LG&E and being assisted with the ASAP assistance program. The addition of even small fees or fee increases can serve as an unnecessary barrier to timely reconnections.

b. Mr. Kinloch states that larger reconnection fees can increase uncollectibles. Provide any evidence, studies, etc. that show the relationship between reconnection fees and uncollectibles.

ANSWER:

Low income families have limited access to assistance from social service agencies. If the customer is disconnected, and large fees combined with back balances require the customer to use up all possible assistance help to achieve reconnection, then if the customer is disconnected again, these assistance resources may not again be available to help. Many social service agencies can help a low-income family only up to given amount within a given timeframe. For example, if a maximum of $100 of help per family per heating season is established as the agency limit and the family uses up all of this $100 of assistance in its first

crisis of the heating season due to high reconnection fees, then additional help may not be available for a future crisis during the same heating season.

This may result in the customer unable to pay a bill, which results in it becoming an uncollectible account. The customer may then have to move to a different apartment, and get a new account in the name of a different family member to again receive service.

c. Explain whether the AG takes exception to ULH&P's cost support for the proposed Reconnection fee.

ANSWER:

There are no specific problems with the calculations used in the analysis, but there are concerns with the general type of methodology used by the Company (see Company's response to KyPSC-DR-02-048). In the Company's analysis, there are round figures for time to process orders and travel to customers. In the Company's response to AG-DR-02-053 (c), (d), and (e), the Company said it has no documentation of these figures but they are simply based on conversations with personnel. Since these are the costs that make up the majority of these fees, these time figures are being based on conversation with Company personnel and thus do not provide a reliable or accurate basis for these costs. If these "estimates" had been 5 minutes less, the reconnection charge calculation would have been only $21.66 as opposed to the $27.08 calculated. Tis methodology is quite susceptible wide variations based on very subjective and undocumented judgments of Company personnel.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Response provided by Counsel

47. Refer to the Kinloch Testimony, pages 22 through 25.
    a. Is Mr. Kinloch familiar with or has he reviewed the three annual AMRP Rider applications submitted by ULH&P since 2002?
    b. Based upon his reading of House Bill 440, would Mr. Kinloch agree that there is nothing in the language of that bill that would prohibit ULH&P from seeking recovery of AMRP costs in 2007 outside of a general rate case? Explain the response.
    c. Provide the basis for the following statement, "It is clear that HB 440 does not authorize the type of tariff rider that ULH&P has requested in its proposal for future use of the AMRP."

Answer:

a. While Mr. Kinloch was made aware of those filings and of the fact that the Attorney General has appealed those cases, he was not asked to review them.

b. There is nothing in HB 440, now codified as KRS 278.509, to prohibit ULH&P from seeking recovery of costs in 2007 outside of a general rate case just exactly as there is nothing in the entitlement of the utility to "demand, collect and receive fair, just and reasonable rates for services rendered or to be rendered by it" under KRS 278.030 to seek added rate recovery outside a general rate case. More importantly, there is also nothing in KRS 278.509 that authorizes the Commission to change ULH&P's rate recovery outside a general rate case. By contrast, KRS 278.183 specifically authorizes a recovery process external to the general rate case process of KRS 278.180 and 278.190, demonstrating that when the General Assembly wants a cost to be subject to recovery outside the general rate case format, it provides for that recovery and the means to achieve that recovery. Absent that specific authority, KRS 278.509 must be read in *pari materia* with the rest of Chapter 278, under which rate recovery occurs via KRS 278.180 and KRS 278.190, just as it does for rate recovery under KRS 278.030.

c. KRS 278.509 provides specifically that the Commission may allow recovery of the costs for investment in pipeline replacement programs that it has found to be fair, just and reasonable. In KRS 278.509 the costs for investment to be allowed are not defined to include a return on investment, in contrast to KRS 278.183, which specifically provides that cost of environmental compliance shall include a reasonable return on construction and other capital expenditures. The return is the company's profit margin on its investment, not a cost. When the General Assembly means for that return to be recovered as an item of cost, is specifically provides for that recovery. It has not done so in KRS 278.509.

While the AMRP tariff rider continues to be the generally worded item it has been since its initial proposal in Case No. 2001-00092, there is nothing in the application to indicate that ULH&P intends to deviate from the including the return on the investment as one of the items whose recovery is sought under the AMRP as it has done in all AMRP filings to date. KRS 278.509 does not include the treatment of the return on the investment as a cost.

Response of the Attorney General to
Initial Data Request of Commission Staff to the Attorney General
Union Light Heat & Power Company
Case No. 2005-00042

Response Provided by Counsel

48. Does the AG have any position concerning ULH&P's proposal to take over customer service lines? Explain the response.

Answer:

The Attorney General took no position on the issue of the take over of customer service lines in Case No. 2001-00092, and takes no position on that issue in this case.