Exhibit:
Issue: Rate of Return
Witness: Kathleen C. McShane
Type of Exhibit: Direct Testimony
Sponsoring Party: Union Electric Company d/b/a Ameren UE
Case No.: GR-2000-512

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. GR-2000-512

DIRECT TESTIMONY

OF

KATHLEEN C. McSHANE

FOSTER ASSOCIATES, INC.
Bethesda, MD 20814
April 3, 2000

Exhibit No. 21
Date 10-4-00 Case No. GR-2000-512
Reporter KK

MISSOURI PUBLIC SERVICE COMMISSION

STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren UE for Authority to File Tariffs Increasing Rates for Gas Service Provided to Customers	))))	Case No. GR-2000-512

AFFIDAVIT OF KATHLEEN C. McSHANE

STATE OF MARYLAND	)	
	)	SS.
CITY OF BETHESDA	)	

Kathleen C. McShane, being first duly sworn on her oath, states:

1. My name is Kathleen C. McShane. I work in the City of Bethesda, Maryland, and I am a Senior Vice President of Foster Associates, Inc., an economic consulting firm.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony consisting of pages 1 through 21, and Schedules 1 through 13 all of which testimony has been prepared in written form for introduction into evidence in Missouri Public Service Commission Case No. GR-2000-512 on behalf of Union Electric Company.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct.

Kathleen C. McShane

Subscribed and sworn to before me this 27 day of March, 2000.

Patricia J Bradley

Notary Public

My Commission Expires
10/14/02

DIRECT TESTIMONY

OF

KATHLEEN C. McSHANE

UNION ELECTRIC COMPANY

d/b/a AmerenUE

CASE NO. GR-2000-512

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Kathleen C. McShane and my business address is 4550 Montgomery Avenue, Suite 350N, Bethesda, Maryland 20814.

Q. What is your occupation?

A. I am a Senior Vice President of Foster Associates, Inc., an economic consulting firm.

Q. What are your educational background and experience?

A. I hold a Masters in Business Administration with a concentration in Finance from the University of Florida (1980) and am a Chartered Financial Analyst (1989). My professional experience is detailed in Appendix A to this Exhibit.

Q. What is the purpose of your testimony?

A. I have been asked to render an opinion on the fair rate of return on equity for Union Electric Company's Missouri gas operations.

My analysis and conclusions regarding the fair return follow; the statistical support for the studies I have conducted is contained in 13 Schedules attached.

II. PRINCIPLES AND SUMMARY OF CONCLUSIONS

Q. What standards underpin your determination of the cost of common equity?

A. There are three standards governing the determination of a fair return which have been articulated in landmark court decisions,[1] as well as numerous utility regulatory decisions. These standards call for a regulated firm and its equity investors to be provided the opportunity to earn a return on the value of its property which:

(1) is commensurate with that of comparable risk enterprises;

(2) assures confidence that the firm can maintain its financial integrity; and,

(3) is adequate to attract capital on reasonable terms.

The legal standards reflect the economic criteria encompassed in the "opportunity cost" principle, which holds that the equity investors should be afforded the opportunity to earn a return commensurate with the returns they could achieve on equity investments of similar risk. The opportunity cost principle is consistent with the fundamental premise on which regulation rests, namely that it is intended to act as a surrogate for competition and provide a fair return to investors.

Three methodologies have typically been utilized in the regulatory forum to estimate the return required to meet the standards: comparable earnings, equity risk premium and discounted cash flow tests.

Q. Please summarize the results of your studies using the three tests.

[1] Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia (262 U.S. 679, 1923) and Federal Power Commission v. Hope Natural Gas Company (320 U.S. 391, 1944).

A.	Comparable Earnings Test	13.5%
	Discounted Cash Flow Test	13.4%
	Equity Risk Premium Test	12.0-14.7%

Q. What factors did you consider in arriving at a final recommendation?

A. My recommendation takes into account the following considerations:

(1) No single test result should be given exclusive weight; each test provides a different perspective and has its own strengths and weaknesses which vary with both the business cycle and stock market conditions.

(2) Both the equity risk premium and discounted cash flow tests (DCF) are market-related tests for measuring the cost of attracting capital by reference to market value. By contrast, the comparable earnings test, which reflects returns on book equity, addresses the fairness standard set forth by the courts.

(3) With the stock market's stellar performance over the past decade, the discrepancy between the market and book values of local gas distribution companies (LDCs) has been increasingly accentuated, to the point that LDC market/book ratios are now a fraction of those of the market (190% for LDCs versus over 875% for the S&P 400 Industrials and 640% for the S&P 500 (includes utilities)) . The DCF test estimates the return required on the market value of common equity. However, regulatory convention applies that return to the book value. When the market value of the stock is close to its book value, the DCF test result can be directly applied to book value. The further the market value of equity is above book value, the greater the extent to which an unadjusted current DCF cost of equity understates the fair return on book equity. To illustrate, a required return of 10% on equity whose value is 170% of book value is not equivalent to a 10% return on the original cost book value. Assuming a stock price of $17.00, a 10.0% return is equal

to an expected cash flow to the equity investor of $1.70; a 10.0% return applied to a book value of $10.00 is only $1.00. Hence, the application of the DCF cost of equity to book value understates the expected return, in dollar terms, by over 40%. Without an adjustment to the DCF cost rates to recognize the significant deviation between current market value and book value, the application of the DCF test will, by definition, significantly understate the return on original cost book value that investors require.

(4) *Estimates of the cost of attracting capital derived from the equity risk* premium tests also tend to understate a fair return on book equity for reasons similar to those applicable to the DCF model. Primarily, the understatement lies in the incompatibility of the premise that a market-derived cost is a measure of the fair return when market values exceed book values. However, since (1) the risk premium estimates are, in part, performed independently of the utility market price; and (2) the historic risk premiums may include some compensation to investors above the "bare-bones" cost of equity, an appropriate market/book adjustment lies between a minimal financing flexibility allowance, which is sufficient only to maintain the market value equal to book in the event new equity is raised, and one which is compatible with a longer-term equilibrium market/book ratio.

(5) In principle, the comparable earnings test is most compatible with regulation on an original cost book value rate base. Under current capital market conditions, characterized by high market valuations, it is of paramount importance to give significant weight to the results of the comparable earnings test.

The above considerations, in conjunction with the results of the three tests, led me to conclude that a fair return on equity for Union Electric Company's Missouri gas operations is, conservatively, in the range of 12.75-13.0%.

III. ECONOMIC AND CAPITAL MARKET TRENDS

Q. Please summarize the recent economic and capital market trends that impact on the cost of capital.

A. Economic growth in the U.S. has averaged in excess of 3.8% for the past five years, and was 4.0% in 1999. The economy has been propelled by both strong consumer spending (4.0% average growth from 1995-1999) and business investment (9.5% growth from 1995-1999). While overall growth for 2000 is forecast at 4.1% (based on the consensus Blue Chip Economic Indicators of March 10, 2000), the pace of growth is expected to moderate over the year. There is little concern that a recession is on the horizon.

Despite strong consumer demand and historically low unemployment (currently 4%), inflation has remained subdued, averaging 2.4% over the past five years and 2.2% in 1999. The March 2000 Blue Chip forecast outlook for inflation indicates a slight uptick in inflation in 2000 to 2.6%, but the expected rate is well within the range of rates that would be considered conducive to continued economic growth.

Continued strong economic growth without substantial inflation has been attributed to rising productivity. Productivity increases averaged 2.3% over the past five years, reaching a seven year high of 2.9% in 1999, marking the fourth straight year that productivity has increased by 2-3%, a run of years unseen since the 1960s. The technology-driven productivity gains have led many economists to question the long held belief that the long run sustainable growth rate in the economy is limited to 2.5%. Indeed, the current (March 2000) consensus forecast for long-term growth is 3.1%, an increase from 2.65% in October 1999.

However, the concerns of the Federal Reserve that the economy is growing too quickly have led to a tightening of monetary policy. In the past nine months, the Fed has raised

interest rates five times, for a total of 1.25%. Treasury bill yields have risen by over 1.0% since mid-1999 to 5.9% in late March 2000; 10-year Treasuries have risen slightly, from 5.9% to 6.1% in late March 2000. The yield curve is now partially inverted, with 30-year Treasuries trading at a yield of 5.90%, 20 basis points below those of 10-year bonds. In large part, the inversion arose from the Federal Government's announcement in early February that it would be scaling back 30-year Treasury sales.

Ten-year Treasuries are quickly becoming the benchmark for the bond market. The March 10, 2000 consensus Blue Chip Economic Indicators indicates that ten-year yields are expected to average 6.5% in 2000 and to gradually decline to approximately 6.0% over the next five years. The most recent Blue Chip Financial Forecast (March 1, 2000) for 30-year Treasuries for 2000 is 6.4%. With the current yield at about 5.9%, a reasonable forecast for the 30-year Treasury yield, to which the equity risk premium is added, is 6.25%.

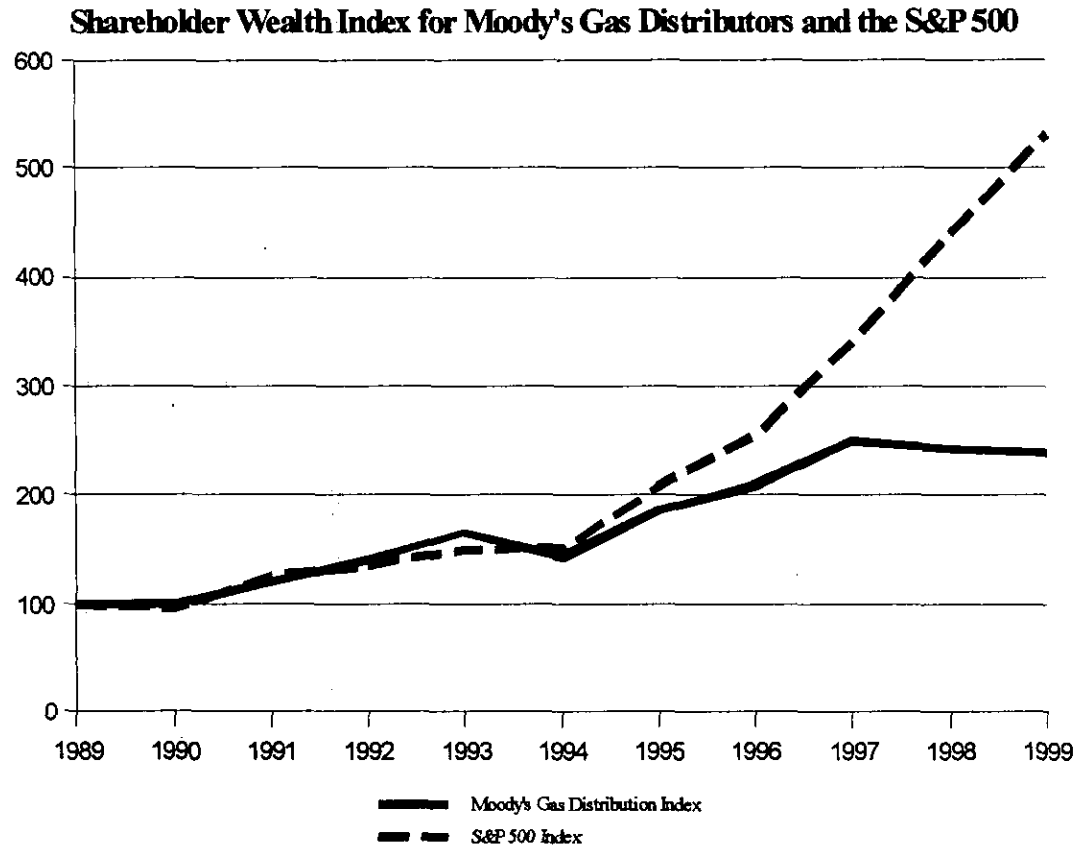
With respect to the equity markets, the economy's strength has been assisted by a stock market that has delivered double digit returns to investors throughout most of the 1990s; the average compound return from the S&P 500 from 1990-1999 was 18%, and 29% during the past five years. Rising consumer wealth from stock market gains has fueled consumer spending; the strength in the stock market has also underpinned the increases in business investment.

The rise in the stock market has been underpinned by strong corporate earnings, relatively low inflation and interest rates, combined with higher productivity. Corporate profits have risen, on average, 8.7% annually since 1995. For 1997-1999, corporate profits as a percent of Gross Domestic Product (GDP) were close to 6.5%, in comparison to 5.0% during the early half of the 1990s. The return on equity for the S&P 500 has averaged 20% from 1995-1998; preliminary data indicate a return in 1999 of about 21%.

In comparison to the overall market, utility stocks have not fared as well, on a risk-adjusted basis. The average compound return on Moody's Gas Distribution Index from 1990-1999 was 9.2%, compared to the S&P 500's 18.2%. Over the past five years (1995-1999), the average annual LDC Index return was 11.0%, compared to 28.6% for the S&P 500.

Figure 1 below highlights the growing divergence between the returns provided to investors by LDC shares and the overall market since 1994.

Figure 1



The lackluster market for utility shares is primarily the result of superior risk/return opportunities in other industries. As allowed returns in the gas distribution industry have declined over the past 10 years, interest rates have declined; the impact on competitive firms' returns has been

just the opposite. The returns for the S&P 500 rose from 14.0% during 1990-1994 to 20% during 1995-1998, while the allowed returns for LDCs generally declined from 12.7% in 1990 to 10.7% in 1999. The divergence between the returns of regulated and competitive firms suggests that recent utility returns have not been commensurate with those of alternative investments. The opportunity to earn such returns can be provided by making the appropriate adjustments to the cost of attracting capital tests and by giving weight to the comparable earnings test.

IV. PROXY FIRMS FOR ESTIMATION OF THE FAIR RETURN ON EQUITY

Q. What principle have you applied in determining how to estimate the fair return for Union Electric's Missouri gas operations?

A. The determination of the fair return for Union Electric's Missouri gas operations is premised on the "stand-alone" principle. That principle holds that the fair return should reflect the business and financial risks to which the Missouri gas operations are exposed, not those of its parent; the happenstance of ownership should not dictate the determination of a fair return.

The parent company, Ameren Corporation, for which market data are available, is primarily an electric utility. Therefore, its market data reflect the risks associated with that business. Hence, rather than estimate a fair return for Union Electric's Missouri gas operations by reference to market data for Ameren, the cost of attracting capital tests should be applied by reference to proxies that operate in the gas distribution business to ensure that the market data capture the business risks to which Union Electric's Missouri gas operations are exposed.

Q. To what companies have you applied the three tests you employ to estimate the fair return on equity for Union Electric's Missouri gas operations?

A. For purposes of applying the equity risk premium and discounted cash flow tests, I relied on a sample of LDCs intended to serve as a proxy for Union Electric's Missouri gas operations.

Q. How did you select the sample of LDCs?

A. I started with all companies classified by *Value Line* as a natural gas distributor and then selected only those that met the following criteria:

- 1998 net revenues above $100 million.
- At least 85% of 1998 year-end assets devoted to natural gas distribution operations.
- Consistent earnings growth rate forecasts available from the IBES data base.

Application of these criteria yielded a sample of 12 LDCs. Schedule 1 lists those LDCs, their 1998 net revenues and percentage of assets devoted to natural gas distribution operations. This sample was used to apply both the discounted cash flow and equity risk premium tests.

Q. Reliance on a sample of gas distributors as a proxy for Union Electric's Missouri gas operations implies that the latter is of similar total risk (business plus financial) to the sample. Is this a reasonable assumption?

A. Yes. Standard & Poor's ranks the business risk of regulated firms on a scale of 1 to 10, with 1 being the least risky and 10 being the most risky. The key elements of business risk that are evaluated include customer markets, competitive position, supply position and regulatory environment.

The average S&P business profile ranking of the LDCs in my sample is 3.25; by comparison, Union Electric's overall operations are ranked 4.0, as are Ameren Corporation's. Although both Union Electric and Ameren are riskier on this scale than the average LDC, there is no

critical element of the business risk profile of Union Electric's Missouri gas operations that would lead investors to perceive Union Electric's Missouri gas operations as facing materially higher or lower business risks than the average LDC.

Q. How does the financial risk of Union Electric's Missouri gas operations compare to its peers?

A. The financial risk can be expressed in terms of the proposed capital structure for ratemaking purposes.

The proposed capital structure for Union Electric's Missouri gas operations is as follows:

Long term debt	39.6%
Preferred stock	3.6
Common equity	56.8

The proposed capital structure is based on that of Union Electric as at 6/30/99, the test year used by the company in its filing.

Q. How does the proposed capital structure compare to those maintained by other local gas distribution utilities?

A. The average common equity ratio for my sample of relatively pure-play LDCs is 52% with a standard deviation of 7.3% (Schedule 2). Union Electric's proposed capital structure lies well within the range of capital structures maintained by the sample of LDCs.

Q. What is the implication of your conclusions?

A. The sample of LDCs provides a reasonable basis for estimating the cost of equity attributable to Union Electric's Missouri gas operations.

Q. To what companies did you apply the comparable earnings test?

A. I relied on a sample of low risk consumer-oriented industrials for purposes of applying the comparable earnings test. Application of the test to utilities would be circular. The difference in investment risk between the industrials and the LDCs was accounted for by an adjustment to the industrials' returns. The sample selection process and the list of companies in the resulting sample are found in Appendix B.

V. FAIR RETURN ON COMMON EQUITY

Q. Please discuss the application of the three tests you have used to determine a fair return on equity for Union Electric's Missouri gas operations.

A. The sections below summarize the conceptual underpinnings, the specific techniques that were used, and the results of each of the three tests.

A. THE COMPARABLE EARNINGS TEST[2]

Q. Please discuss the conceptual underpinnings of the comparable earnings test.

A. The comparable earnings test provides a measure of the fair return based on the concept of opportunity cost. Specifically, the test arises from the premise that capital should not be committed to a venture unless it can earn a return commensurate with that available prospectively in alternative ventures of comparable risk. Since regulation is intended to be a surrogate for competition, the opportunity cost principle entails permitting utilities the opportunity to earn a return commensurate with the levels achievable by competitive firms of similar risk. The comparable earnings test, which measures returns, in relation to book value, is, the only test that can be directly

2 Detailed discussion in Appendix B.

applied to the equity component of an original cost rate base without an adjustment to correct for the discrepancy between book values and current market values.

The concept that regulation is a surrogate for competition implies that the regulatory application of a fair return to an original cost rate base should result in a value to investors commensurate with that of similar risk competitive ventures. The fact that a return is applied to an original cost rate base does not mean that the original cost of the assets is the appropriate measure of their fair market value. The comparable earnings standard, as well as the principle of fairness, suggests that, if competitive industrial firms of similar risk are able to maintain the value of their assets considerably above book value, the return allowed to utilities should likewise not foreclose them from maintaining the value of their assets as reflected in current stock prices.

Q. Please summarize your application of the comparable earnings test.

A. The application of the comparable earnings test began with the selection of a sample of industrials of reasonably comparable risk to LDCs.

The returns for the sample of the 40 selected industrials were measured over the most recent business cycle measured from 1990-1998. Since these returns were achieved over a period during which the average rate of inflation and economic growth can be reasonably assumed to be representative of future economic conditions, the measured earnings are a good proxy for future earnings. The returns for the sample were as follows:

Average	Median	Average of Annual Medians
16.9%	16.8%	16.9%

The results indicate that a low risk industrial may be expected to earn a return of no less than 16.5-17.0%.

Since the industrials are of somewhat higher risk than LDCs, as measured by the betas, the earnings were adjusted for differences in relative betas to arrive at a fair return on book equity for Union Electric's Missouri gas operations. The risk-adjusted return lies in the range of 13.5-13.8%, indicating a fair return of no less than 13.5%.

Q. Why are the results of the comparable earnings test relevant if the sample itself is not directly comparable in risk to the LDCs?

A. There is no legal (or economic) requirement that the sample of competitive firms equates in risk to the regulated company. What is required is the application of appropriate adjustments to the results so that the return is compatible with the risk profile of the regulated firm. That adjustment has been made.

Since the objective of regulation is to simulate competition, it is critical that the determination of a fair return explicitly consider the returns achievable by competitive firms on a risk-adjusted basis. This ensures that circularity is avoided and that the objective of regulation is achieved.

B. DISCOUNTED CASH FLOW TEST[3]

Q. Please summarize the basis for the discounted cash flow (DCF) test.

A. The DCF test is based on the proposition that the price of a common stock is equal to the present value of future cash flows to the investor. If the price of the stock can be observed, the current cash flow (i.e., the dividend) is known, and the growth in cash flows can be inferred, the investor's required return on equity can be derived.

[3]A detailed discussion of the application of the DCF test is contained in Appendix C.

Q. Please describe the DCF model you have used.

A. I have used the constant growth model, which is expressed as follows:

$$\text{Cost of Equity (k)} = \frac{D_o (1+g)}{P_o} + g$$

In words, the cost of equity is equal to the dividend yield plus the expected constant growth rate. The dividend yield component is equivalent to the next expected dividend divided by the recent price.

Q. What growth rates did you rely on to estimate investor expectations?

A. I relied on analysts' consensus forecasts of normalized earnings growth published monthly by IBES International, Inc. Consensus analysts' growth expectations have become virtually a standard input to DCF models. In the longer run, earnings, dividends, book value and stock price should grow in tandem; hence, long-term earnings growth expectations are a proxy for dividend growth.

Q. To what companies did you apply the DCF model?

A. I applied the model to the sample of 12 LDCs, whose selection was described in Section IV of my testimony.

Q. Did you apply the DCF model to Ameren Corporation itself?

A. No, I did not apply the model directly to Ameren for two reasons. The more important reason is because Ameren is primarily an electric utility, as previously noted. The fair return for Union Electric's Missouri gas operations should reflect the risks faced by a gas distribution utility. Therefore, the analysis has been performed using a sample of LDCs as a proxy for Union

Electric's Missouri gas operations. Second, any DCF estimate which relies only on data for a single company is not only subject to measurement errors, but entails considerable circularity.[4]

Q. Please summarize the results of your application of the DCF model to a proxy sample of LDCs.

A. Both the average and median IBES long-term earnings growth expectations were 5.5% respectively (December 1999). The dividend yields (current dividend/average price for the three months ending December 1999) were both 4.7%, based on the average and the median.

The dividend yield needs to be adjusted to be compatible with the constant growth model. The dividend yield component of the model

$$\frac{D_o (1+g)}{P_o}$$

requires that the current dividend yield be raised by the long-term growth expectation. This adjustment raises the dividend yield from 4.7% to 5.0%.

Q. What is the cost of equity suggested by the constant growth model?

A. Adding the longer-term growth expectation (5.5%) to the dividend yield (5.0%) results in a DCF cost of 10.5%.

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[4]For a utility, the growth component of the DCF cost is integrally linked to the allowed ROE. As noted in *Regulatory Finance*: *Utilities' Cost of Capital* by Dr. Roger Morin (Arlington, Va: Public Utilities Reports, 1994),

> "To estimate what ROE resides in the minds of investors is equivalent to estimating the market's assessment of the outcome of regulatory hearings. Expected ROE is exactly what regulatory commissions set in determining an allowed rate of return. If the ROE input required by the model differs from the recommended return on equity, a fundamental contradiction in logic follows. In other words, the method requires an estimate of return on equity before it can even be implemented. Common sense would dictate the inconsistency of a return on equity recommendation that is different than the expected ROE that the method assumes the utility will earn forever. For example, using an expected return on equity ROE of 13% to determine the growth rate and using the growth rate to recommend a return on equity of 11.5% is inconsistent. It is not reasonable to assume that this company is expected to earn 13% forever, but recommend an 11.5% return on equity. The only way this utility can earn 13% is that rates be set by the regulator so that the utility will in fact earn 13%." (page 161)

Q. What does the 10.5% DCF cost represent?

A. It represents the return investors expect to earn on the current market value of their investments in LDC common equities. It does not, however, equate to the return that investors expect LDCs to earn on the book value of their common equity. In fact, *Value Line*, which publishes quarterly its projections of LDC ROEs, anticipates that the average ROE for the sample of 12 LDCs over the period 2002-2004 will be 13.3%.

Q. Isn't there a "disconnect" in logic if one expects the allowed return on equity to be set at the DCF cost of equity?

A. Yes. The return that investors anticipate is a dollar return. A 10.5% market return on an investment which is trading at 170% of book value close to the 1990-1998 average market/book ratio of the sample of LDCs is not equal to a 10.5% return on book value. Simplistically, if the stock price is $17.00, an expected return of 10.5% is equal to $1.78 ($17.00 x 10.5%); if the book value is $10.00, a 10.5% return only equates to a return of $1.05. Application of the 10.5% to book value would cause the market price to decline to book value, so that investors experience a capital loss of 41%. The idea that investors are willing to pay a price equal to 170% of book value in order to see the market value of their investment drop by 41% defies common sense.

Q. Should the regulator discard use of the DCF test under today's market conditions?

A. Not as long as appropriate adjustments are made. It is always incumbent upon the regulator to examine the underlying premises of the tests which are used to estimate a fair return and to determine if the test is valid under the particular capital market conditions which prevail.

The appeal of the discounted cash flow test as a measure of the fair return lies in the relative simplicity of its application. As a measure of the fair return, however, in a regulatory

framework that relies on original cost book value as the base to which the return is applied, the DCF test has severe limitations. The investor's required return as measured by the DCF test (derived directly from the current market price) and the expected return on book value will only converge when the market value is close to book value. In today's capital market environment, that premise does not hold.

Q. Is there a method which permits the DCF cost estimates for the LDCs to be adjusted in a manner which directly accounts for the deviation between book and market value so as to translate the current cost of equity into a fair return on book value?

A. Yes, in a competitive market, stock prices will, over the long term, tend toward an equilibrium level at which market value is equal to the replacement cost of the underlying assets.

Thus, an adjusted DCF test that recognizes the replacement cost/book ratio, in contrast to a "spot" market/book ratio, provides a longer-term indicator of the required return on equity. By repricing the equity of the LDCs for past inflation, an approximation of the replacement cost can be made. The resulting replacement cost/book value for the 12 LDCs was 151% at the end of 1998. The average market/book ratio of the LDCs over the past business cycle was 170%, close to the replacement cost/book value, suggesting that recent market/book ratios are similar to those which should be achieved under the competitive model. It is therefore necessary to adjust the 10.5% DCF cost of equity to reflect replacement cost/book value ratio of a no less than 150%, resulting in a return on equity of 13.4%.

In my opinion, unless an adjustment of this nature is made to the DCF cost for utilities, the results of the test provide no meaningful measure of the fair return on book equity. Hence, the fair return for Union Electric's Missouri gas operations using an appropriately adjusted DCF test is 13.4%.

C. EQUITY RISK PREMIUM TEST[5]

Q. What is the underlying premise of the equity risk premium test?

A. The risk premium test is derived from the basic concept of finance that there is a direct relationship between the level of risk assumed and the return required. Since an investor in common equity is exposed to greater risk than an investor in bonds, the former requires a premium above bond yields in compensation for the greater risk. The risk premium test is a measure of the market-related cost of attracting capital, i.e., a return on the market value of the common stock, not the book value.

Q. How did you apply the equity risk premium test?

A. I used two basic approaches: the Capital Asset Pricing Model (CAPM) and direct estimates of LDC risk premiums by reference to both historic achieved risk premiums and forward-looking risk premium estimates.

Q. How is the CAPM applied?

A. The Capital Asset Pricing Model first requires an estimate of the equity risk premium required by the market as a whole in relation to the yield on long Treasury bonds. That premium is then adjusted for the relative risk of the company or industry being analyzed. The resulting risk premium is then added to the forecast of long Treasury bonds.

Q. How did you estimate the market risk premium?

A. I estimated the market risk premium in two ways: (1) by reference to achieved historic risk premiums; and (2) by reference to a forward looking estimate of the market risk premium.

The historic achieved risk premium was based on long-term differentials between achieved returns on U.S. Treasury bonds and Standard & Poor's 500 Composite. Reliance on

[5]Detailed discussion in Appendix D.

historic risk premiums as a measure of future expectations reflects the assumption that experienced risk premiums and expectations, on average, converge. The achieved market risk premiums measured from 1926-1999 and 1947-1999 have been in the range of 7.5-8.5%.

The forward market risk premium was estimated by calculating a series of quarterly estimates of the cost of equity for the market (proxied by the Standard & Poor's 500) and then subtracting from them the corresponding yield on long Treasury bonds. Rather than focus on a spot differential between the expected market return and long Treasury bond yields, averages were calculated over three periods, 1990-1999, 1995-1999 and 1997-1999, which encompass a relatively low interest rate environment, similar to that expected for the future. The forward-looking risk premium test results suggest a premium of approximately 8.5-10.0%.

Hence, the two methods for estimating the market risk premium indicate an equity risk premium in the range of 7.5-10.0%, or an approximate mid-point of 8.5%.

To adjust the 8.5% market risk premium for the risk of Union Electric's Missouri gas operations relative to the market as a whole, I used the average *Value Line* beta for the sample of 12 LDCs. That recent betas have averaged 0.60. Applying the 0.60 beta to a market equity risk premium of 8.5% results in a risk premium of 5.1%.

Q. What is the LDC risk premium estimated directly from historic risk premiums achieved by gas distributors?

A. The second equity risk premium approach to estimating the required equity return for Union Electric's Missouri gas operations involves measuring the historic achieved risk premiums for the industry (using the Moody's Gas Distribution Index) relative to returns on long Treasury bonds. The historic premiums then serve as a proxy for the future required risk premium. The average historic risk premium was approximately 6.4%.

Q. What is the forward-looking risk premium estimated for LDCs?

A. The forward looking equity risk premium for LDCs can be estimated from a monthly series of differences between DCF estimates for LDCs and the corresponding long Treasury bond yield. A correlation analysis between the risk premium and long Treasury bond yields indicates a forward looking premium of 4.3% at a yield of 6.25%.

Q. What does the equity risk premium analysis indicate?

A. The three approaches indicate an LDC equity risk premium of approximately 5.0-5.5% at a forecast long Treasury yield of 6.25%.

Therefore, the indicated cost of equity is 11.25-11.75%, with a mid-point of 11.5%.

Q. What does the 11.5% result represent?

A. The 11.5% cost determined by reference to the equity risk premium test is a market-derived cost. That cost rate needs to be adjusted to recognize the disparity between market and book value. At a minimum, the adjustment should permit the utility to recover all flotation costs associated with equity financing and to be in a position to raise equity capital without dilution of book value. A minimum allowance for financing flexibility is 50 basis points.[6]

Q. Is the financing flexibility adjustment necessary, given that Union Electric's Missouri gas operations do not issue equity to the public?

A. Yes. Even if a company does not directly raise common equity capital, it is raised by the parent on its behalf. The allowed return should include a component for financing flexibility to ensure that Union Electric's Missouri gas operations contribute proportionately to the parent's financial integrity, i.e., that there are no cross-subsidies.

[6]See Appendix E for discussion of the financing flexibility adjustment.

Q. What is the indicated return if the same adjustment is made for the long-run market/book ratio as made for the DCF test?

A. The equity risk premium test result comparable with a longer-run market/book ratio of 1.50 is 14.7%. [7]

Q. What is the final equity risk premium result?

A. The equity risk premium test results are in the range of 12.0-14.7%. At a minimum, the equity risk premium test indicates a return requirement of 12.0%.

D. RECOMMENDED RETURN ON EQUITY

Q. Please summarize the test results and provide your final recommendation.

A.

Comparable Earnings Test	13.5%
Discounted Cash Flow Test	13.4%
Equity Risk Premium Test	12.0-14.7%

Based on the above results, a conservative estimate of the fair return on equity for Union Electric's Missouri gas operations lies in the range of 12.75-13.0%.

Q. Does this conclude your direct testimony?

A. Yes, it does.

[7] $\frac{1.50\ (11.5\%)}{1 + (.35\ (1.50 - 1.0))} = 14.7\%$

Witness: Kathleen C. McShane
Type of Exhibit: Direct Testimony
Sponsoring Party: Union Electric Company d/b/a Ameren UE
Case No.: GR-2000-512

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APPENDIX A

QUALIFICATIONS OF KATHLEEN C. McSHANE

Kathleen McShane is a Senior Vice President and senior consultant with Foster Associates, Inc., where she has been employed since 1981. She holds an M.B.A. degree in Finance from the University of Florida, and M.A. and B.A. degrees from the University of Rhode Island. She is also a Chartered Financial Analyst.

Ms. McShane worked for the University of Florida and its Public Utility Research Center, functioning as a research and teaching assistant, before joining Foster Associates. She taught both undergraduate and graduate classes in financial management and assisted in the preparation of a financial management textbook.

At Foster Associates, Ms. McShane has worked in the areas of financial analysis, energy economics and cost allocation. Ms. McShane has presented testimony in 75 proceedings on rate of return and capital structure before federal, state, provincial and territorial regulatory boards, on behalf of U.S. and Canadian telephone companies, gas pipelines and distributors, and electric utilities. These studies include the assessment of the impact of competition, rate design, contractual arrangements, and capital structure on return requirements. She has testified before the National Energy Board on behalf of Gaz Metropolitain and the Government of Québec on pipeline cost allocation, quantifying the impact on transportation rates of changes in zoning and of rolled-in versus incremental pricing, has presented evidence on price cap regulation for Maritime Electric before the Island Regulatory and Appeals Commission of Prince Edward Island, and has testified before the Ontario Energy Board on economic principles of cost allocation. Ms. McShane has also provided consulting services for AGT, Ltd., ED TEL, Maritime Electric and Northwest Territories Power on financial issues, including financing, dividend policy, corporate structure, cost of capital and form of regulation.

Ms. McShane was principal author of a study on the applicability of alternative incentive regulation proposals to Canadian gas pipelines. She was instrumental in the design and preparation of a study of the profitability of 25 major U.S. gas pipelines, in which she developed estimates of rate base, capital structure, profit margins, unit costs of providing services, and various measures of return on investment. In a study

prepared for the Canadian Ministry of Energy, Ms. McShane analyzed Federal regulation of U.S. pipelines, including trends in rate design and rate structures. Ms. McShane has also co-managed market demand studies, focusing on demand for Canadian gas in U.S. markets. Other studies performed by Ms. McShane include a comparison of municipal and privately owned gas utilities, an analysis of the appropriate capitalization and financing for a new gas pipeline, risk/return analyses of a proposed water company and an independent power project, and a study on pricing of a competitive product for the U.S. Postal Service. She has also conducted seminars on cost of capital for regulated utilities, with focus on the Canadian regulatory arena.

Publications and Papers

- "Marketing Canadian Natural Gas in the U.S.", (co-authored with Dr. William G. Foster), published by the IAEE in Proceedings: Fifth Annual North American Meeting, 1983.

- "Canadian Gas Exports: Impact of Competitive Pricing on Demand", (co-authored with Dr. William G. Foster), presented to A.G.A.'s Gas Price Elasticity Seminar, February 1986.

- "Market-Oriented Sales Rates and Transportation Services of U.S. Natural Gas Distribution Companies", (co-authored with Dr. William G. Foster), published by the IAEE in Papers and Proceedings of the Eighth Annual North American Conference, May 1987.

- "Incentive Regulation: An Alternative to Assessing LDC Performance", (co-authored with Dr. William G. Foster), presented at the Natural Gas Conference, Chicago, Illinois, sponsored by The Center for Regulatory Studies, May 1993.

- "Atlanta Gas Light's Unbundling Proposal: More Unbundling Required?" presented at the 24th Annual Rate Symposium, Kansas City, Missouri, sponsored by several Commissions and Universities, April 1998.

- "The Effects of Unbundling on a Utility's Risk Profile and Rate of Return", (co-authored with Owen Edmondson, Vice President of ATCO Electric), presented at the Unbundling Rates Conference, New Orleans, Louisiana sponsored by Infocast, January 2000.

Expert Testimony/Opinions
on
Rate of Return & Capital Structure

Alberta Natural Gas	1994
Alberta Power/ATCO Electric	1989, 1991, 1993, 1995, 1998, 1999
BC Gas	1992, 1994
Bell Canada	1987, 1993
Benchmark Utility Cost of Equity (British Columbia)	1999
Canadian Western Natural Gas	1989, 1998, 1999
Centra Gas B.C.	1992, 1995, 1996
Centra Gas Ontario	1990, 1991, 1993, 1994, 1996
Consumers Gas	1988, 1989, 1991, 1992, 1993, 1994, 1995, 1996, 1997
Dow Pool A Joint Venture	1992
Edmonton Water	1994
Enbridge Gas New Brunswick	2000
Foothills Pipe Lines	1993
Gaz Metropolitain	1988
Gazifère	1993, 1994, 1995, 1996, 1997, 1998
Laclede Gas Company	1998, 1999
Maritimes NRG (Nova Scotia) and (New Brunswick)	1999
Multi-Pipeline Cost of Capital Hearing	1994
Natural Resource Gas	1994, 1997
Northwestel, Inc.	2000
Newfoundland Power	1998
Newfoundland Telephone	1992
Northwestern Utilities	1987, 1990
Northwest Territories Power Corp.	1990, 1992, 1993, 1995
Ontario Hydro Services Corp.	1999
Pacific Northern Gas	1990, 1991, 1994, 1997, 1999
St. Lawrence Gas	1997
Southern Union Gas	1990, 1991, 1993
Stentor	1997
Tecumseh Gas Storage	1989, 1990
TransCanada PipeLines	1988, 1989, 1991 (2 cases), 1992, 1993
TransGas and SaskEnergy LDC	1995
Trans Québec & Maritimes Pipeline	1987
Union Gas	1988, 1989, 1990, 1992, 1994, 1996, 1998
Westcoast Energy	1989, 1990, 1992 (2 cases), 1993
West Kootenay Power	1995, 1999
Yukon Electrical Co. Ltd./Yukon Energy	1991, 1993

APPENDIX B

COMPARABLE EARNINGS TEST

Principal Application Issues

The principal issues in the application of the comparable earnings test are:

- The selection of a sample of industrials of reasonably comparable risk to utilities.

- The selection of an appropriate time period over which returns are to be measured in order to estimate prospective returns.

- The need for an adjustment to the "raw" comparable earnings results to reflect the differential risk of utilities relative to the selected industrials.

Selection Process

The selection process starts with the recognition that industrials are exposed to higher business risk, but lower financial risk, than utilities. The selection of industrials focuses on total investment risk, i.e., the combined business and financial risks. The comparable earnings test is based on the premise that industrials' higher business risks can be offset by a more conservative capital structure, thus permitting selection of industrial samples of reasonably comparable investment risk to utilities.

Utilities are generally characterized by relatively low volatility with respect to both earnings and stock market performance. Since consumer-oriented industries, due to their demand characteristics, are likely to exhibit relatively greater stability than other

industries (e.g., extractive industries), the initial universe selection was limited to consumer-oriented industries (SIC codes 2000-3999 and 5000-5999).[1]

From this universe U.S. firms were selected with book data available since 1989, market data available since December 1993 and with common equity of at least $250 million. This initial screen yielded 531 companies. Next, companies with a *Value Line* Safety Rank[2] of 2 were selected, reducing the number of companies to 71. A Safety Rank of 2 is equivalent to the average Safety Rank of the 12 company LDC sample selected for the DCF analysis (see Appendix D) (Schedule 1).

From this group, four companies whose 1990-1998 average returns were above or below one standard deviation from the average were eliminated in order to exclude companies whose earnings are either extraordinarily profitable or chronically depressed. The remaining 59 companies were then arrayed in ascending order of *Value Line* beta. Companies with betas of one or higher were eliminated, producing a final sample of 40 companies. The list of 40 companies is found on Schedule 4.

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[1]The major industrials represented by these SIC codes are: Food and Kindred Products, Tobacco Products, Textiles, Lumber and Wood Products, Paper Products, Petroleum Refining, Chemicals, Rubber, Plastics, Glass, Concrete, Primary Metals, Fabricated Metals, Industrial/Commercial Machinery, Transportation Equipment, Computer and Electronic Equipment, Measuring Equipment, Wholesale and Retail Operations for both durable and non-durable goods.

[2]*Value Line's* definition of Safety Rank is:

"A measure of potential risk associated with individual common stocks rather than large diversified portfolios (for which Beta is a good risk measure). Safety is based on the stability of price, which includes sensitivity to the market (see Beta) as well as the stock's inherent volatility, adjusted for trend and other factors including company size, the penetration of its markets, product market volatility, the degree of financial leverage, the earnings quality, and the overall condition of the balance sheet. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit purchases to equities ranked 1 (Highest) or 2 (Above Average) for Safety."

Sample Risk Characteristics

The sample has the following risk characteristics, compared to the sample of LDCs:

	Industrials (Average)	**LDCs (Average)**
S&P: Debt Ratings	A-	A/A-
Value Line Risk Measures: Safety Rank Earnings Predictability Financial Strength Beta	 2 77 A 0.82	 2 65 B++ 0.58
Common Equity Ratio	66.8%	51.8%

Source: Schedules 1, 2, 4 and 5.

Although the individual values for the LDCs and industrials are not identical, they are similar enough so that the returns for the industrials can be used as a point of departure. As suggested earlier, the common equity ratios of the industrials are higher than those of the LDCs (67% versus 52%), confirming that the industrials' higher business risks tend to be offset by lower financial risks. To recognize that the betas indicate that the LDCs face lower investment risk, an adjustment to the industrials return can be quantified using the relative beta coefficients of the two samples.

Period for Measurement of Returns

The measurement of returns for competitive industrials is, in large part, historical. The test, however, is intended, as are all tests used to estimate the fair return, to be prospective in nature. Therefore, the returns earned in the past should be analyzed in the context of the longer-term outlook for the economy to determine the reasonableness of relying on past returns as a proxy for the future. Since returns on equity tend to be cyclical, the returns should be measured over an entire business cycle, in order to give fair representation to years of expansion and decline. The forward looking nature of the estimate of the fair return requires selection of a cycle which is reasonably representative of prospective economic conditions. The past business cycle (measured from point to point), covering the period 1990-1998, meets those criteria, essentially because it reflects an inflation rate (2.3% based on the GDP Price Index) and real economic growth rate (2.9%) (Schedule 6, page 2) that are quite close to the consensus estimates for longer-term (10-year) inflation and growth (2.0% inflation measured by the GDP Price Index; 3.1% expected growth in real GDP).[3]

The achieved returns of the 40 companies for 1990-1998 are as follows:

Average	16.9%
Median	16.8%
Average of Annual Medians	16.9%

Source: Schedule 7.

The results indicate that a low risk industrial in the consumer-oriented industries may be expected to earn a return of no less than 16.5-17.0%.

[3]Blue Chip Economic Indicators, March 2000.

Relative Risk Adjustment

The results can be adjusted by reducing that portion of the book return in excess of the yield on a risk-free long-term security proxied by the 30-year Treasury bond (i.e., the risk premium) by the ratio of LDC betas to the industrial betas. Using a forecast yield of 6.25% on 30-year Treasury bonds as the risk-free rate, the average LDC beta of 0.58, and the average industrial beta of 0.82 (Schedules 1 and 5), the adjustment is made as follows:[4]

.58/.82 (16.5% - 6.25%) + 6.25% = 13.5%.
.58/.82 (17.0% - 6.25%) + 6.25% = 13.8%.

The risk-adjusted result of no less than 13.5% represents the fair return on original cost book equity for Union Electric's Missouri gas operations, and, as such, a return which is compatible with providing an opportunity to a utility to earn a return in relation to original cost book value commensurate with that achievable by competitive firms of similar investment risk.

[4]The adjustment effectively relies on the assumptions underpinning the Capital Asset Pricing Model discussed in Appendix D.

APPENDIX C

DISCOUNTED CASH FLOW TEST

Conceptual Underpinnings

The discounted cash flow approach proceeds from the proposition that the price of a common stock is the present value of the future expected cash flows to the investor, discounted at a rate which reflects the riskiness of those cash flows. If the price of the security is known (can be observed), and if the expected stream of cash flows can be estimated, it is possible to approximate the investor's required return (or capitalization rate) as the rate which equates the price of the stock to the discounted value of future cash flows.

Theoretically, the cost flows extend to infinity. However, as the expected cash flows extend further into the future, their discounted value adds less and less to the price of the stock. Moreover, investors in common stocks are unlikely to forecast (or be able to forecast with any accuracy) cash flows beyond five years.

There are multiple versions of the discounted cash flow model available to estimate the investor's required return. An analyst can employ a constant growth model or a multiple period model to estimate the cost of equity. The constant growth model rests on the assumption that investors expect cash flows to grow at a constant rate throughout the life of the stock. Alternatively, if the growth rate in earnings and dividends can be expected to alter as the stock passes through the life cycle from initial growth to maturity to decline, a multiple period model can be used which incorporates changing growth expectations.

The subsequent analysis uses the constant growth model. The constant growth model is expressed as follows:

$$\text{Cost of Equity (k)} = \frac{D_o (1 + g)}{P_o} + g$$

In words, the formula states that the DCF cost of equity is equal to the dividend yield plus the expected constant growth rate. The dividend yield component $D_o (1 + g)/P_o$, is equivalent to the next expected dividend divided by the recent price.

Estimation of Growth Expectations

The assumption that investors expect a stock to grow at a constant rate over the longer term is most applicable to stocks in mature industries. Growth rates in these industries will vary from year to year and over the business cycle, but will tend to deviate around a long-term expected value. As a pragmatic matter, the application of a constant growth model is compatible with the likelihood that investors do not forecast beyond five years. Hence, the current market price and dividend yield do not explicitly anticipate any changes in the outlook for growth.

However, the inability to measure investor expectations of growth is one of the limitations of the DCF approach. Note that it is the investor's expectations that must be inferred; it is the investors who have set the market price. Even if the underlying expectations appear unreasonable, i.e., seem to represent a "castle in the air view", if these expectations are embedded in the dividend yield, these expectations must be accepted if the dividend yield and growth rate components are to be internally consistent.

Various studies have concluded that analysts' forecasts are a better predictor of growth than naive forecasts equivalent to historic growth; moreover analysts' forecasts have been shown to be more closely related to investors expectations.[1] In addition, the impending restructuring of the gas distribution industry renders historical growth rates suspect as a measure of investor expectations.

Forecasts are widely available to both individual and institutional investors; the latter are particularly influential in determining market movements. Each month IBES International, Inc. releases its compilation of a consensus of analysts= forecasts for longer-term (5-year) normalized earnings growth rates for individual companies. The IBES estimates are virtually a standard input to DCF

[1] Support for these statements are found in the following studies: Dov Fried and Dan Givoly, "Financial Analysts Forecasts of Earnings: A Better Surrogate for Market Expectations," *Journal of Accounting and Economics*:, Vol. 4, 1982; Robert S. Harris, "Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return", *Financial Management*, Spring 1986.

models for estimating the cost of equity. In principle, in the longer-term growth in dividends, earnings, book value and stock price should be the same. Since earnings are the fundamental driving force behind potential growth in dividends, forecasts of normalized earnings growth are a reasonable approximation for investor expectations of future dividend growth.

I applied the discounted cash flow test to a sample of 12 LDCs that serve as a proxy for Union Electric's Missouri gas operations. This sample includes all LDCs:

(1) classified by *Value Line* as a gas distributor;

(2) with 1998 net revenues of at least $100 million;

(3) with assets devoted to natural gas distribution operations of no less than 85% of total assets; and

(4) for which consistent earnings growth rate forecasts are available from the IBES data base.

The resulting 12 LDCs are found on Schedule 1.

Application of the DCF Model to LDCs

Both the average and median IBES expectation of long-term earnings growth (December 1999) for the 12 gas distributors were 5.5%. The dividend yields, calculated using the average of the closing prices for the three months ending December 1999 in relation to the corresponding dividend, were both 4.7%, based on the average and the median for the LDC sample. (Schedule 8).

The current dividend yield needs to be adjusted for growth expectations in order to be compatible with the constant growth model. The dividend yield component of the model contains the next expected dividend as measured by the current dividend (D_o) adjusted for the longer term growth expectation. Hence, the current dividend yield of 4.7% should be adjusted for the 5.5% growth rate

to arrive at an adjusted yield of 5.0%. When the adjusted yield is added to the expected growth rate, the required return on the current value of equity is approximately 10.5%.

The 10.5% cost rate represents the return investors expect to achieve on the current value of their investment in LDC common equities. It does not represent the return on book value investors expect LDCs to earn. *Value Line* publishes quarterly its longer-term estimates of returns on book value for each of the LDCs in the proxy sample. The average ROE *Value Line* projects that the 12 LDCs will earn during the period 2002-2004 is 13.3% (Schedule 8).

It is clear that there is a "disconnect" in logic if one assumes that investors expect the return on equity to be set at the DCF cost of equity. The return that investors expect to earn is a dollar return. A 10.5% return on the current value of equity is clearly not equivalent to a 10.5% return on book value when the market value exceeds book value. The average LDC market/book ratio of approximately 170% (Schedule 12) would reflect a market price of $17.00 and a book value of $10.00. In simplistic terms, a 10.5% return on the market price of $17.00 is $1.78; a 10.5% return on a book value of $10.00 is only $1.05.

Not only is the 10.5% inconsistent with the forecast ROE of 13.3% for the sample of LDCs, but it represents a value which, if applied to book value, rather than to the market value from which it was derived, will tend to push the market value toward book value, i.e., to a market/book ratio of 1.0. It is illogical to presume that investors in utility stocks are prepared to pay a premium of 70% above book value, when the acceptance of the DCF result as a measure of the fair return on book equity

would cause investors to suffer a significant loss as the market value of their stock declined toward book value.[1]

The regulator should examine the underlying premises of the tests to see if they are valid under current market circumstances. In current capital markets, the wide deviation between market price of utility stocks and the book value means that the return estimated by reference to a utility market price will not equate to the returns expected on book value. These returns will only be equivalent when the market value is close to the book value. Hence, the application of an unadjusted DCF cost to the book value of equity cannot result in a fair return when market values are significantly above book values.

To arrive at an estimate of a fair return on equity using the DCF test applied to utilities as a point of departure, it is necessary to recognize that under competition, equity market values tend to gravitate toward the replacement cost of the underlying assets. Absent inflation, the market value of firms operating in a competitive environment would tend to equal their book value or cost. This is due to the economic proposition that, if the discounted present value of expected returns (market value) exceeds the cost of adding capacity, firms will expand until an equilibrium is reached, when the market value equals the replacement cost of the productive capacity of the assets. However, the fact that inflation has occurred changes the above analysis. Under competition, the market value of a firm tends toward the current cost of its assets. The book value, by comparison, reflects the historic depreciated cost of the assets. Since there have been moderate to relatively high levels of inflation

[1]To illustrate, assume a utility's book value is $10.00 and its stock sells at $17.00 (so that its market-to-book ratio is 170%); its approved return is 13.0% (earnings per share of $1.30); and its payout ratio is 65% (dividend per share of $0.845). An application of the DCF formula would show a yield of 5.0% ($0.845) $17.00), and a longer-term "sustainable" growth rate of 4.55% (35% x 13.0%, i.e., growth = percent of earnings retained x return on equity), for a DCF cost of 9.55%.

If the calculated DCF cost is applied to book value, earnings would decline to $0.955 per share ($10.00 x 9.55%), the payout ratio would rise to 88% ($0.845) $0.955) and the longer-term growth rate would decline to 1.1% (12% x 9.55%). Hence, investors' expectations for growth of 4.55% would not be realized, and the stock price would decline to book value. The expected return on the revalued stock would be 9.55%, comprised of a dividend yield of 8.45% ($0.845) $10.00) and growth of only 1.1%. However, the realized holding period return for an investor purchasing the stock at $17.00 per share (assuming a one year work-out period) would be a capital loss of 41%. The proposition that investors are willing to invest $17.00 per share to end up with a stock whose value is $10.00 defies common sense.

over the past two business cycles, one would expect the market value to deviate systematically from the book value.

For reliance on the DCF cost result to produce a return compatible with the premise that regulation is a surrogate for competition, the DCF cost should be adjusted to reflect the replacement/book value. In principle, this value should correspond to the long-run equilibrium market/book ratio.

One can approximate replacement cost by repricing the equity of the LDCs to account for the impact of inflation, thus providing a measure of what the long-term market/book value of LDCs should be in a competitive market. For the sample of 12 LDCs, the median repriced equity/book value ratios at the end of 1998 was 151%. The average of the median market/book ratios of the utilities over the past business cycle was 170% (Schedule 9), indicating that the utilities' actual market/book ratios have been close to the value consistent with competitive expectations.

Therefore, the replacement cost/book value relationship provides an economically sound basis for adjusting the current DCF cost of equity to a fair return on book value. The DCF model itself provides a technique for making the required adjustment.

$$ROE = \frac{M/B\ (k)}{1 + [r\ (M/B-1)]}$$

where:

ROE	=	return on book equity
k	=	market-derived cost of equity
r	=	earnings retention rate

The derivation of the formula is found on Schedule 13.

Using the repriced equity/book value ratio of 150% as a proxy for the longer-run competitive market/book ratio, a market-derived cost of equity of 10.5% and a longer-term earnings retention rate of 35%, the fair return can be estimated as follows:

$$\frac{1.50\ (10.5\%)}{1 + [.35\ (1.50 - 1.0)]} = 13.4\%$$

APPENDIX D

EQUITY RISK PREMIUM TEST

Conceptual Considerations

The risk premium test is derived from a basic concept of finance which holds that there is a direct relationship between the risk of an investment and the return that an investor will require to commit capital to the investment. Since an investment in common equity is generally riskier than a bond investment, the required return for a common stock is higher than that for a bond. The equity risk premium test, as applied herein, measures the risk premium required by an investor relative to an investment in long-term U.S. Treasury bonds. The U.S. Treasury bond, which is considered to be free of default risk, represents a proxy for the long-term risk-free rate.

The equity risk premium expected or required by investors is not static; it widens and narrows with changes in economic and capital market conditions (e.g., the business cycle and inflation) and is also dependent on the risk of the individual company. This suggests that a technique for measuring the risk premium that tracks changes in the required risk premium would be preferable to one which only averages achieved risk premiums over long periods.

In principle, there are two broad approaches which can be used to estimate the required risk premium. The first measures the risk premium for the entire stock market, which can be developed from an analysis of achieved market risk premiums or prospective estimates of market risk premiums. These estimated market risk premiums are then adjusted to reflect the risk of a particular stock or industry relative to the market as a whole. The Capital Asset Pricing Model (CAPM) provides a theoretical basis for making the relative risk adjustment. The CAPM presumes that all investors are diversified and are compensated only for market, or systematic risk, which cannot be diversified away. This systematic risk, or beta, is a measure of the relative volatility of a particular stock, or class of securities, in relation to the volatility of the capital

market as a whole. Therefore, the risk premium for a particular stock or portfolio is the market-wide risk premium multiplied by its beta coefficient.

The second approach develops the risk premium for a particular stock or industry directly.

The notion that the equity risk premium may fluctuate in a predictable and quantifiable fashion stems from the observation that as nominal interest rates rose in the late 1970s and early 1980s, the equity risk premium narrowed. Three studies of U.S. data quantified this relationship.[1]

One explanation of the observed inverse relationship between interest rates and equity risk premiums is the increasing level of uncertainty that appears to accompany rising inflation. As the expected rate of inflation rises, investors perceive increasing uncertainty that the actual future inflation rate will be different from the expected rate. Since investors in bonds are adversely affected by rising inflation, greater uncertainty regarding the future course of inflation may lead to a perceived increase in the riskiness of bonds relative to stocks, and hence an incremental risk premium on bonds for the uncertainty of inflationary expectations. This has been referred to as a "lock-in" premium. Thus, when capital markets are characterized by high and volatile levels of nominal interest rates, the equity risk premium (i.e., the required premium above bond yields) declines; conversely, when inflation fears abate, the equity risk premium will tend to rise.

Risk Free Rate

The starting point for the application of the risk premium test is the expected yield on 30-year Treasury bonds, which serve as a proxy for the risk-free rate. Reliance on the 30-year Treasury yield recognizes (1) the administered nature of short-term rates; and (2) the long-term nature of the assets to which the equity return is applicable.

[1]These three studies support an inverse relationship between interest rates and risk premiums both for industrials and utilities: Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, "The Risk Premium Approach to Measuring a Utility's Cost of Equity", Financial Management, Spring 1985; Robert S. Harris, "Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return", Financial Management, Spring 1986; Robert S. Harris, "Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts, Financial Management, Summer 1992.

The most recent Blue Chip Financial Forecast (March 1, 2000) for 30-year Treasuries for 2000 is 6.4%. With the current yield at about 5.9%, a reasonable forecast for the 30-year Treasury yield, to which the equity risk premium is added, is 6.25%.

Application of the Capital Asset Pricing Model

The application of the Capital Asset Pricing Model requires an estimate of the required market risk premium and an estimate of the relative risk adjustment, or beta, to recognize the differential risk between the market and the stock or industry being analyzed.

The estimation of the required market risk premium relies on two approaches:

(1) historic achieved risk premiums based on long-term differentials between achieved returns on U.S. Treasury bonds and Standard & Poor's 500 Composite. Reliance on historic risk premiums as a measure of future expectations reflects the assumption that experienced risk premiums and expectations, on average, converge.

(2) A prospective market risk premium based on the difference between discounted cash flow estimates of the expected market return for the S&P 500 and the corresponding long-Treasury yields, adjusted for the forecast yield on long Treasury bonds.

In looking at achieved market risk premiums, reliance on longer-term periods is intended to capture all types of economic events; this factor must be balanced with the recognition that structural changes in the economy may alter the relationship between experienced and expected risk premiums. The latter consideration warrants placing significant weight on the post-World War II period.

The following table summarizes the average U.S. experience for both the longest period available as well as for only the post-Wold War II period. The latter is intended to capture any changes in the basic structure of the economy which may have occurred, while still incorporating the various

types of economic events (e.g., periods of boom and recession, high and low inflation rates) which may be repeated in the future:

IBBOTSON & SINQUEFIELD: HISTORIC EQUITY RISK PREMIUMS	
1926-1999	1947-1999
7.8%	8.7%

Source: Schedule 10

The returns above reflect the arithmetic average of the one-year returns. In the context of relying on experienced returns as a proxy for future returns, the arithmetic average is regarded as the appropriate measure. As explained by Ibbotson Associates, *Stocks, Bonds, Bills and Inflation, 1998 Yearbook*, pp. 157-159: "The expected equity risk premium should always be calculated using the arithmetic mean. The arithmetic mean is the rate of return which, when compounded over multiple periods, gives the mean of the probability distribution of ending wealth values . . . in the investment markets, where returns are described by a probability distribution, the arithmetic mean is the measure that accounts for uncertainty, and is the appropriate one for estimating discount rates and the cost of capital."

The above data indicate that, based solely on an analysis of the average experienced premiums, investors could expect an average equity risk premium of approximately 7.5-8.5%.

The experienced market risk premium may converge with investor expectations over the longer-term, but the application of a current interest rate to a longer-term average may be unrepresentative of investor expectations in a specific capital market environment.[2]

It is widely accepted that the required market risk premium is not static, but varies with the outlook for inflation, interest rates and profits (e.g., the business cycle). Hence, a direct estimate of the prospective market risk premium provides a measure of the current level of the expected differential between stock and bond returns, given the outlook for inflation, interest rates and profits.

The expected differential may be determined by application of the DCF model to the S&P 500. To illustrate, the fourth quarter 1999 dividend yield for the S&P 500 was 1.1%. The consensus forecast for five year normalized earnings growth rates available for the index from IBES for the fourth quarter 1999 was 16.9%. The resulting expected return is 18.2%. The difference between

[2]The table below divides risk premiums from 1926-1999 into periods characterized by different economic conditions. The averages indicate that market risk premiums declined when inflation was rising, gradually increased as inflation and inflation fears fell and have been relatively high during periods of moderate inflation and relatively stable interest rates. The results suggest that investors are likely to anticipate higher equity risk premiums in periods of steady growth, low inflation and low interest rates.

U.S. RISK PREMIUMS (1926-1999)								
Period	Description	Stock Returns	Bond Returns	Bond Yields	CPI Growth	GDP Growth	Risk Premiums in Relation to:	
							Bond Returns	Bond Yields
1926-1939	Pre-War, Market Crash, Deflation	9.8%	5.0%	3.1%	-1.6%	1.3% a/	4.8%	6.8%
1940-1951	Growth and Inflation, Early Post World War II	13.2	2.4	2.3	5.5	6.3	10.8	10.9
1952-1967	Steady Low Inflation, Robust Growth	14.8	1.6	3.8	1.6	3.8	13.2	11.0
1968-1982	Rising Inflation, Interest Rates, Stagflation	8.4	6.0	8.3	7.4	2.7	2.4	0.1
1983-1991	Falling Nominal and Real Interest Rates, Moderately High/Steady Inflation	17.8	13.6	9.1	3.9	3.5	4.2	8.7
1992-1999	Low Inflation and Interest Rates, Moderate/Steady Growth	20.3	8.6	6.5	2.6	3.6	11.6	13.8

a/ 1930-1939

the expected market return of 18.2% and the fourth quarter 1999 long-Treasury yield of 6.4% produces a forward looking estimate of the market risk premium of 11.8%. The magnitude of this current differential is driven by the increase in expected earnings growth rates which have risen from 11.5% in 1995 to 14% in 1998 and are currently close to 17% (Schedule 11).

The increase in the expected market return over the past two years, in the face of declining interest rates, reflects the shift in the market portfolio to higher growth technology based stocks and the increasing confidence that technology-driven productivity gains will underpin higher sustainable growth rates.

Rather than focus on a spot differential between the expected market return and long Treasury bond yields, averages were calculated over the past ten, five and three years. These periods encompass a relatively low interest rate environment, similar to that expected for the future.

The table below summarizes the results:

Period	Expected Market Return	Long Treasury Bond Yield	Expected Differentials
1990-1999	15.4%	7.0%	8.4%
1995-1999	15.6	6.3	9.3
1997-1999	16.2	6.0	10.2

Source: Schedule 11.

On average, the forward looking risk premium test suggests a premium of approximately 8.5-10.0%.[3]

Considering both the experienced risk premiums and forward-looking market premium estimates, the expected market premium is in the range of 7.5-10.0%, with an approximate mid-point of 8.5%.

The 8.5% market risk premium needs to be adjusted to reflect the risk of LDCs relative to the market.

To represent relative risk, the betas of the sample of 12 LDCs selected for the discounted cash flow analysis were used (see Appendix C). Empirical studies have shown that the CAPM understates the return requirement for companies with betas less than the market mean of 1.0. Reliance on *Value Line* betas, which are adjusted for betas' tendency to trend toward the market mean of 1.0, assists in mitigating the model's tendency toward understatement of required returns for low beta (e.g., utility) stocks.

The average *Value Line* beta for the sample of LDCs has been approximately 0.60. (The individual *Value Line* betas for the 12 LDCs are provided in Schedule 1.)

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[3]These averages are compatible with polls of individual investors' expectations:

Ivo Welch, "Views of Financial Economists on the Equity Premium and on Professional Controversies," Anderson Graduate School of Management at UCLA, December 15, 1999, states the following,

"Small investor surveys tend to find equity premium expectations between 10 percent and 15 percent per year. On 10/10/97, the New York Times reports that a Montgomery Asset Management telephone survey found an expected 1-year stock market return of 22 percent. On 7/28/1999, the New York Times reports that a similar Paine-Webber survey found expected stock market returns in excess of 20 percent for both the 1-year and 10-year horizons. On 11/15/1999 the Financial Times reports a Gallup/Paine-Webber poll which found "only" a 16 percent expected stock market return over both 1 and 10 year horizons.

A similar poll cited in the Wall Street Journal (12/14/98) found that the average annual return investors expect from stocks over the next 10 years is 16%.

In summary, based on a market risk premium of 8.5% and a *Value Line* beta for the proxy sample of gas LDCs of 0.60, the required equity risk premium for an average LDC is 5.1% (0.60 beta x 8.5% market risk premium).

Risk Premium based on Achieved Risk Premiums for the Gas Distribution Industry

Reliance on achieved risk premiums for the gas distribution industry as an indicator of what investors expect for the future is based on the same proposition as that used in the development of the market risk premium: over the longer term, investors' expectations and experience converge. The more stable an industry, the more likely it is that this convergence will occur.

The achieved equity risk premiums for Moody's Gas Distribution Index[4] were calculated over the period 1947-1999. The historic arithmetic (1-year) average risk premium was 6.4% (Schedule 10).

DCF-Based Equity Risk Premium Test for LDCs

A forward looking risk premium for a utility can be estimated as a series of differences between the discounted cash flow estimates of the cost of equity for a representative sample of utilities and the corresponding long government bond yield, where the DCF cost is the sum of the dividend yield (adjusted for growth) and the investor's expectation of long-term growth. Investment analysts' consensus forecasts of five-year (normalized) earnings growth, available from IBES, are used as a proxy for investors' expectations of long-term growth.

For each gas distributor in the LDC sample, monthly DCF costs were estimated as the sum of the month-end dividend yield and the corresponding IBES five-year earnings growth expectation. The monthly risk premium was calculated as the difference between the DCF cost and the month-

[4]Through the end of 1999, the Moody's Gas Distribution Index included the following seven companies: AGL Resources, Inc.; Indiana Energy Inc.; Keyspan Energy; Laclede Gas Co.; Northwest Natural Gas Co.; Peoples Energy Corp. , and Washington Gas Light Co.

end long Treasury bond yield. The analysis was limited to the post Order 636 period (1993-1999).

The average risk premium over the entire period was 4.2%; the corresponding Treasury bond yield averaged 6.5%. Looking only at the last three years (1997-1999), as in the analysis for the S&P 500, during which bond yields averaged 6.0%, close to prevailing levels, the average risk premium was 4.3%. (Schedule 12).

The time series nature of the data lends itself to an analysis of the relationship between the LDC equity risk premium and interest rate changes over time.

A regression analysis used to estimate this relationship indicates the following:

U.S. Gas Distributor Risk Premium = 7.65 -.54 (long Treasury yield)

R^2 = 33.3%

At a long Treasury yield of 6.25%, the indicated risk premium is 4.3%.

In sum, the analysis for the LDC sample indicates a risk premium of about 4.25% at a 6.25% long Treasury yield.

Conclusions from the Equity Risk Premium Tests

The table below summarizes the results of the equity risk premium tests.

Capital Asset Pricing Model	5.1%
Achieved Gas Distribution Utility Risk Premiums	6.4%
DCF-Based Risk Premium for Gas Distributors	4.25%

The results indicate a required risk premium for an average risk gas distributor of approximately 5.0-5.5% at a long Treasury yield of 6.25%. The resulting "bare-bones" cost of equity is 11.25-11.75% before adjustment for financing flexibility.

Market/Book Ratio Adjustment

Similar to the DCF model, the equity risk premium model in principle results in a return required on the current value of equity. However, since reliance on historic achieved risk premiums may incorporate some compensation above the "bare-bones" cost of equity, the adjustment for the difference between market and book value should lie between a minimal allowance for financing flexibility and the required adjustment to achieve an equilibrium longer-run market/book value. As fully described in Appendix E, the minimum financing flexibility adjustment is 50 basis points. A 50 basis point adjustment raises the equity risk premium result to 12.0%. As discussed in Appendix C, in the longer-term the market value should trend toward replacement cost, which is approximately equivalent to a market/book ratio of 1.5 times. The adjustment to the "bare-bones" equity risk premium result compatible with a market/book ratio of 1.5 times raises the 11.5% return to approximately 14.7%.

APPENDIX E

ADJUSTMENT FOR FLOTATION COSTS

The equity risk premium test result represents a return which conceptually, if applied to the book value of equity, would cause the utility market/book ratio to equal 1.0. This cost needs to be adjusted to permit the utility a certain degree of financial flexibility and integrity.

The flotation cost allowance is intended to serve two distinct but related purposes: first, to permit a company to recover all costs associated with issuing additional stock as required to meet its obligation to serve, at not less than book value per share, and thus without harming (diluting) the investment of existing shareholders, and second, to position the company at all times such that if it needs to issue additional equity to meet its obligation to serve, it can do so without harm to its existing shareholders.

The adjustment should at a minimum include:

(a) Financing costs, or out-of-pocket issue expenses. These comprise primarily administrative costs and the underwriters' fee. For gas distributors, this component averaged 5.8% over the 10-year period 1985-1994. On an after-tax basis, the cost is approximately 4.0%.[1]

(b) An allowance for market pressure, i.e., the tendency for the price of the stock to fall as an additional supply of stock is introduced into the market, of approximately 2-3 percent of the market price.

The article entitled "Total Flotation Costs for Electric Company Equity Issues", by Victor M. Borun and Susan L. Malley, *Public Utilities Fortnightly*, (February 20, 1986), summarizes the various studies which have been performed using utility data, as well as presents the results, of a study

[1]EBASCO Services, Inc., *Analysis of Public Utility Financing*, various issues, 1985-1994.

covering 641 electric utility issues. The various studies provide support for a market pressure adjustment of 2-3%.

Conceptually, the measurement of market pressure should be made by reference to the change in market price from the time of the announcement of the sale of additional equity to the time of the sale of this equity, with due regard to the trend of market prices in this period. However, the anticipation of raising equity may precede the announcement, particularly for utilities, so that the market may already reflect (partly, or entirely) the impact of dilution at the time of the announcement. It may then appear that there is no market pressure, when in fact it is merely not statistically measurable. To capture the impact of market pressure, it is therefore necessary to rely on a large number of observations. Moreover, since the flotation cost allowance is essentially a composite figure which is designed to recover flotation costs associated with past and future issues of various sizes, measurement of the market pressure component by reference to a large sample of issues of many relative sizes is appropriate.

The sum of the first two elements (6-7%) comprises an estimate of the minimum allowance required to afford a utility some financing flexibility.

This total gives no consideration to the fairness principle, which would recognize that competitive industrials have, in periods of moderate inflation, consistently been able to maintain the real value of their assets, as evidenced by market/book ratios significantly in excess of 1.0. Utilities should not be precluded from achieving a level of financial integrity that gives some recognition to the tendency for industrial market values to equate to replacement costs and thus produce market/original cost book values significantly in excess of 1.0. This is not only a fairness argument, but an economic argument, inasmuch as it is the role of regulation to simulate competition, under which long-run market value should equate to the replacement cost of the productive capacity. The argument is even stronger when regulated utilities are also exposed to competition.

Hence, a flotation cost adjustment of 6.5% is conservative.

A 6.5% flotation cost adjustment is approximately equivalent to an adjustment sufficient to permit a utility to maintain a market/book ratio of 1.065%.

The DCF formula provides a means of adjusting the market-derived cost to arrive at the book return required for a market/book ratio of 1.065% (see Schedule __ for derivation):

$$\text{Return on Book Equity} = \frac{\text{Market/Book Ratio x Market-Derived Cost}}{1 + [\text{earnings retention rate } (M/B - 1)]}$$

To achieve a market/book ratio of 1.065%, based on a longer-term dividend payout ratio of 65% (retention rate of 35%) and a cost of capital of 11.5%, the required return is 12.0%.

$$12.0\% = \frac{1.065\ (11.5\%)}{1 + [.35\ (1.065 - 1.0)]}$$

Hence, a minimum flotation cost allowance, the difference between 12.0% and 11.5%, is 50 basis points.

NET REVENUES, PERCENTAGE OF UTILITY ASSETS, S & P DEBT RATINGS AND VALUE LINE RISK MEASURES FOR SELECTED LOCAL NATURAL GAS DISTRIBUTION COMPANIES

	1998 Net Revenues	1998 Percentage of Utility Assets	S&P Senior Debt Rating	Value Line Risk Measures: Safety Rating	Earnings Predictability	Financial Strength	Beta
AGL RESOURCES INC	1338.6	100	BBB+	2	80	B++	0.65
ATMOS ENERGY CORP	848.2	91	A-	2	60	B++	0.55
CASCADE NATURAL GAS CORP	189.7	100	BBB+	3	45	B	0.55
CONNECTICUT ENERGY CORP	242.4	100		2	85	B++	0.60
INDIANA ENERGY INC	466.4	100	A+	2	75	A	0.50
NEW JERSEY RESOURCES	710.3	94		2	100	B++	0.55
NICOR INC	1465.1	93	A+	1	90	A+	0.60
NORTHWEST NATURAL GAS CO	416.7	94	A	2	25	B++	0.60
PEOPLES ENERGY CORP	1138.1	100	A+	1	55	A	0.75
PIEDMONT NATURAL GAS CO	765.3	100	A	2	85	B++	0.55
SOUTHWEST GAS CORP	917.3	97	BBB-	3	20	B	0.55
WASHINGTON GAS LIGHT CO	1040.6	100	AA-	1	65	A	0.55
Average	794.9	97	A/A-	2	65	B++	0.58

Source: Standard & Poor's Research Insight; Annual Reports to Shareholders; Value Line, September 1999.

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Schedule 1
Page 1 of 2

VALUE LINE BETAS FOR LOCAL NATURAL GAS DISTRIBUTION COMPANIES

Company	March 1998	June 1998	September 1998	December 1998	March 1999	June 1999	September 1999	December 1999
AGL Resources Inc	0.70	0.70	0.70	0.65	0.65	0.65	0.65	0.65
Atmos Energy Corp	0.55	0.60	0.55	0.55	0.55	0.55	0.55	0.55
Cascade Natural Gas Corp	0.60	0.60	0.60	0.55	0.55	0.55	0.55	0.55
Connecticut Energy Corp	0.60	0.65	0.70	0.60	0.60	0.60	0.60	0.55
Indiana Energy Inc	0.70	0.70	0.70	0.55	0.60	0.55	0.50	0.50
New Jersey Resources	0.60	0.60	0.60	0.55	0.55	0.60	0.55	0.55
Nicor Inc	0.70	0.70	0.65	0.65	0.65	0.65	0.60	0.60
Northwest Natural Gas Co	0.65	0.65	0.65	0.60	0.60	0.60	0.60	0.60
Peoples Energy Corp	0.85	0.85	0.80	0.80	0.75	0.75	0.75	0.75
Piedmont Natural Gas Co	0.55	0.60	0.60	0.55	0.60	0.55	0.55	0.55
Southwest Gas Corp	0.75	0.75	0.70	0.65	0.60	0.55	0.55	0.60
Washington Gas Light Co	0.75	0.75	0.70	0.60	0.60	0.60	0.55	0.60
Average	0.67	0.68	0.66	0.61	0.61	0.60	0.58	0.59

Source: Value Line, various issues.

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CAPITAL STRUCTURE FOR SELECTED LOCAL NATURAL GAS DISTRIBUTION COMPANIES

	Year	Long-Term Debt	Preferred Stock	Common Equity
AGL RESOURCES INC	1999	52.6	0.0	47.4
ATMOS ENERGY CORP	1999	51.1	0.0	48.9
CASCADE NATURAL GAS CORP	1999	50.9	2.5	46.6
CONNECTICUT ENERGY CORP	1999	44.9	0.0	55.1
INDIANA ENERGY INC	1999	37.0	0.0	63.0
NEW JERSEY RESOURCES	1999	50.4	0.1	49.5
NICOR INC	1998	42.2	0.5	57.4
NORTHWEST NATURAL GAS CO	1998	45.6	4.4	49.9
PEOPLES ENERGY CORP	1999	40.4	0.0	59.6
PIEDMONT NATURAL GAS CO	1999	46.4	0.0	53.6
SOUTHWEST GAS CORP	1998	60.4	4.5	35.2
WASHINGTON GAS LIGHT CO	1999	41.6	2.3	56.1
Average		47.0	1.2	51.8

Source: Standard & Poor's Research Insight.

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Schedule 3

INTEREST COVERAGE BEFORE TAXES
FOR SELECTED LOCAL GAS DISTRIBUTION COMPANIES

	1994	1995	1996	1997	1998	1999	Average 1994-1998	Average 1995-1999
AGL RESOURCES INC	3.06	1.99	3.58	3.48	3.32	3.26	3.09	3.12
ATMOS ENERGY CORP	2.85	3.07	3.53	2.14	3.45	1.74	3.01	2.79
CASCADE NATURAL GAS CORP	2.07	2.16	1.58	2.68	2.42	3.00	2.18	2.37
CONNECTICUT ENERGY CORP	2.58	2.75	2.76	2.86	2.94	2.84	2.77	2.83
INDIANA ENERGY INC	4.26	4.24	5.14	2.88	4.73	4.75	4.25	4.35
NEW JERSEY RESOURCES	3.01	2.94	3.56	3.87	4.34	4.54	3.54	3.85
NICOR INC	4.99	4.61	4.95	5.01	4.81	NA	4.87	NA
NORTHWEST NATURAL GAS CO	3.22	3.29	3.70	3.13	2.19	NA	3.10	NA
PEOPLES ENERGY CORP	3.29	2.76	4.86	5.02	4.18	4.68	4.02	4.30
PIEDMONT NATURAL GAS CO	3.20	3.15	3.50	3.56	3.88	3.79	3.46	3.57
SOUTHWEST GAS CORP	1.76	1.08	1.28	1.42	2.38	NA	1.58	NA
WASHINGTON GAS LIGHT CO	4.05	4.13	5.26	4.82	3.87	3.99	4.43	4.41
Average	3.19	3.01	3.64	3.40	3.54	3.62	3.36	3.51

Source: Standard & Poor's Research Insight

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CAPITAL STRUCTURE RATIOS FOR 40 LOW RISK INDUSTRIALS
FISCAL YEAR END 1998

	Long-Term Debt	Preferred Stock	Common Equity
AIR PRODUCTS & CHEMICALS INC	47.6	0.0	52.4
ALBERTO-CULVER CO	24.4	0.0	75.6
ALBERTSONS INC	37.7	0.0	62.3
AVERY DENNISON CORP	36.0	0.0	64.0
BALDOR ELECTRIC	18.0	0.0	82.0
BANDAG INC	17.6	0.0	82.4
BARD (C.R.) INC	22.1	0.0	77.9
BAXTER INTERNATIONAL INC	53.1	0.0	46.9
BECTON DICKINSON & CO	35.1	1.0	63.9
BEMIS CO	35.8	0.0	64.2
BRIGGS & STRATTON	31.1	0.0	68.9
CONAGRA INC	46.9	0.0	53.1
DEXTER CORP	50.7	0.0	49.3
EATON CORP	38.7	0.0	61.3
ECOLAB INC	26.0	0.0	74.0
FARMER BROS CO	0.0	0.0	100.0
FEDERAL SIGNAL CORP	30.4	0.0	69.6
GENERAL DYNAMICS CORP	10.2	0.0	89.8
HERSHEY FOODS CORP	45.8	0.0	54.2
HILLENBRAND INDUSTRIES	24.2	0.0	75.8
HORMEL FOODS CORP	20.6	0.0	79.4
JOHNSON CONTROLS INC	34.8	1.1	64.1
KNIGHT-RIDDER INC	47.9	0.1	52.1
LITTON INDUSTRIES INC	39.5	0.1	60.4
LONGS DRUG STORES INC	2.4	0.0	97.6
MAY DEPARTMENT STORES CO	50.4	0.3	49.3
MCCORMICK & CO	41.5	0.0	58.5
NALCO CHEMICAL CO	46.1	3.6	50.3
PEPSICO INC	44.4	0.0	55.6
SBARRO INC	0.0	0.0	100.0
SHERWIN-WILLIAMS CO	33.1	0.0	66.9
SONOCO PRODUCTS CO	48.8	0.0	51.2
SUPERVALU INC	53.1	0.2	46.7
TELEFLEX INC	37.2	0.0	62.8
THOMAS & BETTS CORP	44.5	0.0	55.5
TRW INC	42.4	0.0	57.6
UNIVERSAL CORP/VA	35.2	0.0	64.8
UNIVERSAL FOODS CORP	42.4	0.0	57.6
VF CORP	19.9	1.3	78.8
WINN-DIXIE STORES INC	*3.6*	*0.0*	*96.4*
Average	33.0	0.2	66.8

Source: S&P Research Insight

US40CS

S & P DEBT RATINGS AND VALUE LINE RISK MEASURES FOR 40 LOW RISK INDUSTRIALS

	S&P Senior Debt Rating	Value Line Risk Measures			
		Safety Rating	Earning Predictability	Financial Strength	Beta
AIR PRODUCTS & CHEMICALS INC	A	2	70	B++	0.90
ALBERTO-CULVER CO	BBB+	2	95	B++	0.75
ALBERTSONS INC	A	2	90	A+	0.65
AVERY DENNISON CORP	A	2	90	A	0.95
BALDOR ELECTRIC		2	90	B++	0.65
BANDAG INC		2	80	B++	0.75
BARD (C.R.) INC	BBB+	2	90	A	0.95
BAXTER INTERNATIONAL INC	A	2	90	A	0.95
BECTON DICKINSON & CO	A+	2	100	A	0.95
BEMIS CO	A	2	95	A+	0.95
BRIGGS & STRATTON	BBB+	2	45	A	0.80
CONAGRA INC	BBB+	2	95	A	0.70
DEXTER CORP	A	2	30	A	0.95
EATON CORP	A	2	60	A	0.80
ECOLAB INC	A	2	100	B++	0.75
FARMER BROS CO		2	40	A	0.50
FEDERAL SIGNAL CORP		2	85	A	0.80
GENERAL DYNAMICS CORP	A	2	85	A	0.80
HERSHEY FOODS CORP	A+	2	95	A	0.65
HILLENBRAND INDUSTRIES	A+	2	75	A	0.80
HORMEL FOODS CORP		2	65	A	0.55
JOHNSON CONTROLS INC	A-	2	100	A	0.95
KNIGHT-RIDDER INC	A	2	50	B++	0.85
LITTON INDUSTRIES INC	BBB	2	65	B++	0.90
LONGS DRUG STORES INC		2	90	A	0.85
MAY DEPARTMENT STORES CO	A+	2	90	A	0.95
MCCORMICK & CO	A	2	80	B++	0.65
NALCO CHEMICAL CO	A+	2	35	A	0.90
PEPSICO INC	A	2	80	A+	0.90
SBARRO INC	BB-	2	85	B++	0.70
SHERWIN-WILLIAMS CO	A	2	100	A	0.90
SONOCO PRODUCTS CO	A	2	95	A	0.95
SUPERVALU INC	BBB+	2	90	B++	0.85
TELEFLEX INC		2	100	B++	0.85
THOMAS & BETTS CORP	BBB	2	40	B++	0.90
TRW INC	BBB	2	35	B+	0.80
UNIVERSAL CORP/VA	A-	2	40	A	0.60
UNIVERSAL FOODS CORP	BBB	2	95	B++	0.75
VF CORP	A-	2	80	B++	0.95
WINN-DIXIE STORES INC		2	80	A+	0.85
Average	A-	2	77	A	0.82

Source: S&P Research Insight, Value Line

US40RS

TREND IN INTEREST RATES AND OUTSTANDING BOND YIELDS
(Percent Per Annum)

Year		Prime Rate	Government Securities: 3-Month Treasury Bills a/	Government Securities: 10-Year Treasury Bonds	Government Securities: 30-Year Treasury Bonds b/
1976		6.84	5.00	7.61	7.86
1977		6.83	5.26	7.42	7.67
1978		9.06	7.22	8.41	8.49
1979		12.67	10.04	9.44	9.29
1980		15.27	11.51	11.46	11.30
1981		18.87	14.08	13.91	13.44
1982		14.86	10.69	13.00	12.76
1983		10.79	8.63	11.10	11.18
1984		12.04	9.58	12.44	12.39
1985		9.93	7.49	10.62	10.79
1986		8.33	5.97	7.68	7.80
1987		8.22	5.82	8.39	8.59
1988		9.32	6.69	8.85	8.96
1989		10.87	8.12	8.49	8.45
1990		10.01	7.51	8.55	8.61
1991		8.46	5.42	7.86	8.14
1992		6.25	3.45	7.01	7.67
1993		6.00	3.02	5.87	6.59
1994		7.23	4.34	7.08	7.37
1995		8.81	5.44	6.58	6.88
1996		8.27	5.04	6.44	6.73
1997		5.44	5.11	6.32	6.58
1998		8.31	4.79	5.26	5.54
1999		8.02	4.71	5.69	5.91
1999	Jan	7.75	4.31	4.67	5.12
	Feb	7.75	4.53	5.18	5.49
	Mar	7.75	4.38	5.24	5.63
	Apr	7.75	4.34	5.26	5.58
	May	7.75	4.50	5.56	5.80
	June	7.75	4.75	5.87	6.03
	July	8.00	4.54	5.86	6.05
	Aug	8.25	4.88	5.97	6.08
	Sep	8.25	4.72	5.92	6.09
	Oct	8.25	5.00	6.16	6.30
	Nov	8.50	5.20	6.20	6.29
	Dec	8.50	5.32	6.43	6.48
2000	Jan	8.50	5.39	6.68	6.57
	Feb	8.75	5.75	6.41	6.14

a/ Rates on new issues.

b/ 20-year constant maturities for 1974-1978; 30-year maturities after 1978. Series represents yields on the more actively traded issues adjusted to constant maturities by the U.S. Treasury based on daily closing bids.

Note: *Monthly data reflect rate in effect at end of month.*

Source: Annual Statistical Digest (Federal Reserve System); Federal Reserve Bulletin (various issues).

cs07 US

**INFLATION AND GROWTH AS MEASURED BY
THE GDP PRICE INDEX AND REAL GDP GROWTH
(Chained 1996 Dollars)**

	GDP Price Index	Annual Inflation	Real GPD	Annual Growth
1989	83.6		6568.7	
1990	86.8	3.9%	6683.5	1.8%
1991	89.8	3.4%	6669.2	-0.2%
1992	91.7	2.2%	6891.1	3.3%
1993	94.2	2.7%	7054.1	2.4%
1994	96.1	2.1%	7337.8	4.0%
1995	98.2	2.1%	7537.1	2.7%
1996	100.0	1.8%	7813.2	3.7%
1997	101.7	1.7%	8165.1	4.5%
1998	102.9	1.2%	8516.3	4.3%
1999	104.3	1.4%	8861.0	4.0%
Compound Average Return:				
1990 -1998	2.3%		2.9%	
1991 -1999	2.1%		3.2%	

Source: Business Statistics, Survey of Current Business.

INFLGR

RETURNS ON EQUITY AND MARKET/BOOK RATIOS
FOR 40 LOW RISK INDUSTRIALS

	1990	1991	1992	1993	1994	1995	1996	1997	1998	Average 1990-1998	Average M/B Ratio 1990-1998
AIR PRODUCTS & CHEMICALS INC	14.7	14.1	14.1	9.6	10.8	16.0	16.7	16.4	20.6	14.8	232
ALBERTO-CULVER CO	17.9	12.5	14.4	14.1	14.1	15.1	15.8	18.5	16.1	15.4	260
ALBERTSONS INC	23.2	22.5	21.3	24.5	27.1	25.5	23.5	22.2	21.7	23.5	455
AVERY DENNISON CORP	0.9	7.5	9.8	10.9	15.1	18.6	21.4	24.5	26.7	15.1	307
BALDOR ELECTRIC	11.9	9.3	10.9	12.7	15.3	16.3	17.1	18.2	17.6	14.4	244
BANDAG INC	35.1	29.9	26.3	21.1	22.2	23.3	20.1	27.9	12.7	24.3	387
BARD (C.R.) INC	11.9	16.2	19.8	16.0	18.2	17.3	15.9	12.3	44.2	19.1	349
BAXTER INTERNATIONAL INC	-0.3	14.6	15.4	-7.7	17.3	17.5	21.6	11.7	11.5	11.3	317
BECTON DICKINSON & CO	15.7	14.5	13.5	13.8	15.4	17.4	20.8	22.2	15.8	16.6	286
BEMIS CO	18.1	17.0	16.6	12.6	18.5	18.3	18.7	17.8	17.0	17.2	311
BRIGGS & STRATTON	13.3	13.1	17.3	20.9	26.8	24.9	19.7	14.5	21.2	19.1	232
CONAGRA INC	20.0	17.2	17.1	19.3	20.0	7.6	26.0	23.9	12.6	18.2	390
DEXTER CORP	12.6	-2.2	12.1	10.8	11.5	11.4	13.1	15.1	8.3	10.3	183
EATON CORP	15.7	6.5	13.3	17.5	23.9	21.8	16.9	21.9	16.9	17.2	242
ECOLAB INC	*12.3*	*-69.6*	*20.0*	*21.2*	*20.2*	*21.6*	*23.2*	*25.0*	*31.0*	*11.7*	*384*
FARMER BROS CO	15.0	14.2	12.0	13.1	5.3	9.5	10.4	7.0	12.8	11.0	122
FEDERAL SIGNAL CORP	22.0	20.0	20.0	21.0	22.3	22.0	23.8	20.6	19.1	21.2	398
GENERAL DYNAMICS CORP	-31.8	28.9	42.3	58.0	19.1	22.3	16.5	17.4	17.6	21.1	201
HERSHEY FOODS CORP	18.3	17.0	17.3	20.7	12.9	22.3	24.3	33.4	36.0	22.5	451
HILLENBRAND INDUSTRIES	18.0	19.2	20.3	24.6	13.4	12.5	18.3	18.8	20.0	18.3	381
HORMEL FOODS CORP	15.7	15.7	15.5	16.6	19.2	17.3	10.5	13.8	17.2	15.7	260
JOHNSON CONTROLS INC	8.4	8.3	10.3	11.5	13.9	14.9	16.1	17.7	18.4	13.3	172
KNIGHT-RIDDER INC	16.5	12.9	12.5	12.2	13.9	14.3	23.9	30.8	22.8	17.8	266
LITTON INDUSTRIES INC	13.9	5.1	13.8	11.3	-10.8	19.7	18.0	16.5	16.3	11.5	191
LONGS DRUG STORES INC	16.7	13.8	12.0	10.4	9.5	8.8	10.9	10.1	10.4	11.4	173
MAY DEPARTMENT STORES CO	20.1	18.9	19.6	20.3	19.6	16.9	18.0	20.4	21.7	19.5	264
MCCORMICK & CO	19.5	21.5	23.0	22.0	12.8	19.3	10.3	23.3	26.6	19.8	408
NALCO CHEMICAL CO	26.9	26.0	24.5	25.2	15.7	25.9	24.2	24.4	4.5	21.9	428
PEPSICO INC	24.5	20.7	23.9	27.2	27.0	22.7	16.5	31.6	29.9	24.9	578
SBARRO INC	24.7	20.8	18.8	19.0	19.5	11.7	19.1	17.0	14.7	18.4	332
SHERWIN-WILLIAMS CO	17.1	15.7	16.3	17.0	17.9	17.7	17.5	17.4	16.5	17.0	283
SONOCO PRODUCTS CO	9.8	17.6	14.5	20.0	19.1	22.3	21.2	-0.1	23.0	16.4	317
SUPERVALU INC	16.8	20.7	15.2	15.4	3.5	13.9	13.9	18.5	15.3	14.8	194
TELEFLEX INC	16.4	14.9	14.2	13.2	14.2	14.7	15.0	16.1	16.5	15.0	234
THOMAS & BETTS CORP	*14.1*	*13.6*	*12.3*	*11.6*	*13.1*	*14.0*	*8.2*	*16.8*	*8.8*	*12.5*	*251*
TRW INC	11.3	-7.9	12.5	14.9	19.8	22.3	22.0	-2.6	27.2	13.3	238
UNIVERSAL CORP/VA	9.5	6.1	20.5	22.3	9.7	6.7	17.7	22.7	27.8	15.9	199
UNIVERSAL FOODS CORP	22.1	21.6	14.0	18.6	16.1	19.2	12.4	17.7	18.5	17.8	278
VF CORP	9.4	17.8	22.2	18.0	16.5	8.8	15.8	18.0	19.4	16.2	219
WINN-DIXIE STORES INC	19.1	20.4	23.9	24.4	21.2	20.2	19.8	15.3	14.7	19.9	370
Median	16.0	15.7	15.9	17.3	16.3	17.5	17.8	17.9	17.6	16.8	272
Average										16.9	295
Average of Medians										16.9	268

Source: Standard & Poor's Research Insight

US40ROE

DCF COST OF EQUITY, HISTORIC PAYOUT RATIOS, AND VALUE LINE RETURN ON EQUITY AND PAYOUT FORECASTS FOR SELECTED LOCAL NATURAL GAS DISTRIBUTION COMPANIES (Percentages)

	4Q 1999 Dividend Yield	IBES Long-Term EPS Growth Forecast (December 1999)	DCF Cost 1/	Value Line ROE Forecast (2002-2004)	Historic Dividend Payout Ratios (1993-1999)	Value Line Dividend Payout Forecast (2002-2004)
AGL RESOURCES INC	6.1	5.0	11.4	12.5	103.5	67.6
ATMOS ENERGY CORP	5.2	7.0	12.6	17.0	82.9	46.7
CASCADE NATURAL GAS CORP	5.6	4.5	10.4	12.0	112.3	64.5
CONNECTICUT ENERGY CORP	3.5	6.4	10.1	11.5	76.8	69.6
INDIANA ENERGY INC	5.0	6.5	11.8	15.0	74.8	53.3
NEW JERSEY RESOURCES	4.3	6.0	10.5	16.0	76.6	56.1
NICOR INC	4.4	6.5	11.1	16.5	59.5	55.9
NORTHWEST NATURAL GAS CO	5.0	4.0	9.2	11.0	75.3	60.0
PEOPLES ENERGY CORP	5.4	4.5	10.2	13.5	81.2	64.2
PIEDMONT NATURAL GAS CO	4.4	6.0	10.7	13.5	70.1	59.3
SOUTHWEST GAS CORP	3.5	5.0	8.7	8.5	89.4	56.3
WASHINGTON GAS LIGHT CO	4.4	4.8	9.4	13.0	74.2	58.7
Average	4.7	5.5	10.5	13.3	81.4	59.4
Median	4.7	5.5	10.4	13.3	76.7	59.0

1/ Adjusted dividend yield plus growth;
[DY*(1+Growth)] + Growth

Source: IBES International, Inc., Standard & Poor's Research Insight, Value Line.

VLGDDCF

MARKET/BOOK AND REPRICED EQUITY/BOOK VALUE RATIOS
FOR SELECTED LOCAL NATURAL GAS DISTRIBUTION UTILITIES

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Average 1990-1998	Average 1990-1999	1998 Repriced Equity/ Book Value
AGL RESOURCES INC	163	176	188	192	170	170	186	177	171	155	177	175	149
ATMOS ENERGY CORP	130	143	160	180	190	186	204	221	230	217	183	186	113
CASCADE NATURAL GAS CORP	149	162	176	174	163	157	162	163	164	168	163	164	158
CONNECTICUT ENERGY CORP	142	146	163	180	167	140	131	144	156	188	152	156	147
INDIANA ENERGY INC	152	161	186	198	184	170	180	207	231	211	185	188	154
NEW JERSEY RESOURCES	140	145	155	185	178	162	181	197	213	227	173	178	145
NICOR INC	198	187	190	205	193	187	223	258	269	NA	212	NA	223
NORTHWEST NATURAL GAS CO	137	146	154	164	159	148	154	175	174	NA	157	NA	152
PEOPLES ENERGY CORP	138	146	165	176	160	146	162	180	178	167	161	162	259
PIEDMONT NATURAL GAS CO	156	154	175	213	204	178	183	195	218	218	186	189	136
SOUTHWEST GAS CORP	87	71	76	92	93	104	128	134	152	NA	104	NA	150
WASHINGTON GAS LIGHT CO	145	155	173	194	180	161	169	181	195	192	173	175	161
Median	144	150	169	183	174	162	174	180	187	192	173	175	151
Average of Medians (1990-1998)	169												

Source: Standard & Poor's Research Insight

VLLDCMB

Schedule 9

HISTORIC MARKET EQUITY RISK PREMIUMS
(Percentages)

	Annual Average Returns		Risk Premium in Relation to:
	S & P 500 Common Stock Index	Long-Term U.S. Treasury Bonds 1/	S & P 500 Common Stock Index
1926-1999	13.3	5.5	7.8
1947-1999	14.6	5.9	8.7

	Annual Average Returns		Risk Premium in Relation to:
	Moody's Gas Distribution Stock Index	Long-Term U.S. Treasury Bonds	Moody's Gas Distribution Stock Index
1947-1999	12.25	5.9	6.4

1/ Average of annual income returns.

Source: Stocks, Bonds, Bills and Inflation: 1999 Yearbook, Ibbotson Associates; Moody's Public Utility Manual.

IS99

Schedule 11

S & P 500 CALCULATED DCF COSTS, CORRESPONDING LONG TREASURY YIELDS AND RISK PREMIUMS

	S & P 500				
	IBES 5-Year EPS Growth Forecast	Dividend Yield	DCF Cost	Long Treasury Bond Yield	Risk Premium
1990 1Q	11.5 %	3.2 %	15.1 %	8.4 %	6.6 %
2Q	11.7	3.6	15.7	8.7	7.1
3Q	11.9	3.7	16.0	8.8	7.2
4Q	11.7	3.8	15.9	8.5	7.4
1991 1Q	11.8	3.0	15.2	8.2	7.0
2Q	11.9	3.5	15.7	8.3	7.4
3Q	11.9	3.1	15.4	8.2	7.2
4Q	11.9	3.0	15.4	7.9	7.5
1992 1Q	12.1	2.9	15.3	7.8	7.5
2Q	12.0	3.2	15.6	7.9	7.7
3Q	12.0	3.0	15.4	7.4	7.9
4Q	12.0	2.8	15.1	7.5	7.6
1993 1Q	11.8	2.8	14.9	7.0	8.0
2Q	11.5	2.9	14.7	6.9	7.9
3Q	11.3	2.9	14.5	6.3	8.2
4Q	11.3	2.6	14.1	6.2	7.9
1994 1Q	11.4	2.7	14.3	6.7	7.6
2Q	11.5	3.0	14.9	7.3	7.5
3Q	11.6	2.8	14.7	7.6	7.2
4Q	11.6	2.8	14.7	7.9	6.8
1995 1Q	11.5	2.6	14.4	7.6	6.8
2Q	11.6	2.7	14.7	6.9	7.7
3Q	11.9	2.4	14.6	6.7	7.9
4Q	12.0	2.3	14.6	6.2	8.4
1996 1Q	11.9	2.2	14.4	6.4	8.0
2Q	12.3	2.2	14.8	7.0	7.9
3Q	12.5	2.4	15.2	7.0	8.2
4Q	12.8	2.0	15.1	6.6	8.5
1997 1Q	13.0	1.8	15.0	6.9	8.1
2Q	13.3	1.8	15.3	6.9	8.4
3Q	13.7	1.6	15.5	6.5	9.1
4Q	13.6	1.6	15.4	6.1	9.3
1998 1Q	13.7	1.4	15.4	5.9	9.4
2Q	14.0	1.4	15.6	5.9	9.8
3Q	14.4	1.6	16.2	5.3	10.9
4Q	14.6	1.3	16.1	5.2	11.0
1999 1Q	15.7	1.3	17.1	5.5	11.7
2Q	15.7	1.2	17.1	5.8	11.3
3Q	16.0	1.3	17.5	6.1	11.4
4Q	16.9	1.1	18.2	6.4	11.8
Averages					
1990 -1999	12.6	2.4	15.4	7.0	8.4
1995 - 1999	13.6	1.8	15.6	6.3	9.3
1997 - 1999	14.6	1.4	16.2	6.0	10.2

Source: I/B/E/S, Inc., Standard & Poor's Compustat Services, Inc.

SPMRP

DIVIDEND YIELDS, IBES GROWTH RATE FORECASTS, DCF COSTS AND RISK PREMIUMS FOR SELECTED LOCAL NATURAL GAS DISTRIBUTION COMPANIES

	Dividend Yields	IBES EPS Growth Forecast	DCF Cost	U.S. Long Treasury Yield	Risk Premium	Dividend Yield/ Treasury Yield
1993 1Q	5.2	6.3	12.1	7.0	5.1	74.9
2Q	5.1	6.2	11.9	6.9	5.0	73.7
3Q	4.8	6.2	11.4	6.3	5.1	77.0
4Q	5.1	5.8	10.9	6.2	4.7	82.1
1994 1Q	5.2	5.5	10.7	6.7	4.0	77.4
2Q	5.7	5.7	11.6	7.3	4.2	77.7
3Q	5.8	5.3	11.6	7.6	4.1	76.9
4Q	6.2	5.0	11.5	7.9	3.5	78.1
1995 1Q	5.9	4.8	11.0	7.6	3.4	77.0
2Q	5.8	4.5	10.7	6.9	3.8	84.1
3Q	5.7	4.4	10.6	6.7	3.9	84.4
4Q	5.4	4.8	10.3	6.2	4.1	86.8
1996 1Q	5.2	4.9	10.3	6.4	3.9	82.0
2Q	5.4	5.0	10.3	7.0	3.4	77.0
3Q	5.2	5.0	10.4	7.0	3.3	74.7
4Q	4.9	5.0	10.2	6.6	3.6	74.2
1997 1Q	5.1	5.0	10.3	6.9	3.4	73.4
2Q	5.0	5.0	10.2	6.9	3.3	71.9
3Q	4.7	5.0	10.0	6.5	3.6	72.9
4Q	4.4	5.1	10.1	6.1	4.0	72.4
1998 1Q	4.4	5.3	10.2	5.9	4.3	74.2
2Q	4.4	5.3	10.2	5.8	4.4	76.0
3Q	4.7	5.5	10.6	5.3	5.3	87.6
4Q	4.3	5.4	10.0	5.2	4.9	83.4
1999 1Q	4.9	5.4	10.6	5.5	5.1	90.1
2Q	4.4	5.5	10.4	5.8	4.6	76.6
3Q	4.5	5.5	10.2	6.1	4.2	73.4
4Q	4.8	5.5	10.4	6.4	4.1	75.0
Averages						
1993-1999	5.1	5.3	10.7	6.5	4.2	78.0
1997-1999	4.6	5.3	10.3	6.0	4.3	77.2

Note: Values reflect quarterly averages of monthly data used in the analysis.

Source: Standard & Poor's Research Insight, IBES International, Inc.,
U.S. Federal Reserve Statistical Release

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DERIVATION OF IMPLICIT RELATIONSHIP AMONG "BARE-BONES" COST OF CAPITAL, RETURN ON BOOK EQUITY AND MARKET/BOOK RATIO

Assume the following:

k = the equity capitalization rate, i.e., the "bare-bones" cost of equity
D = dividend per share
E = earnings per share
M = current market price
B = current book value per share
b = retention rate
r = return on book equity
RE = per-share retained earnings
g = sustainable growth as measured by b(r)

DCF cost of capital:

$$(1)\quad k = \frac{D}{M} + g$$

Price of stock:

$$(2)\quad M = \frac{D}{k - g}$$

From the definition of return on book equity:

$$(3)\quad r = \frac{E}{B} = \frac{D}{B} + \frac{RE}{B}$$

If, from the assumptions,

$$(4)\quad g = br,$$

$$(5)\quad \text{by definition,}\quad g = \frac{RE}{E} \times \frac{E}{B} = \frac{RE}{B}$$

Substitute Equation (5) into Equation (3):

$$(6)\quad r = \frac{D}{B} + g$$

Solve for Equation (6) for B:

$$(7)\quad B = \frac{D}{r - g}$$

Divide Equation (2) by Equation (7) to obtain an expression of the market/book ratio:

$$(8)\quad M/B = \frac{\frac{D}{k - g}}{\frac{D}{r - g}} = \frac{r - g}{k - g}$$

From the formulation of g = b(r) in Equation (4):

$$(9)\quad M/B = \frac{r - [b(r)]}{k - (b)(r)} = \frac{(1 - b)r}{k - br}$$

Solve Equation (9) for r:

$$(10)\quad r = \frac{M/B \times k}{1 + b\left(\frac{M}{B} - 1\right)}$$