KEN PRUITT
President of the Senate

MARCO RUBIO
Speaker of the House of Representatives

STATE OF FLORIDA
OFFICE OF PUBLIC COUNSEL

c/o THE FLORIDA LEGISLATURE
111 WEST MADISON ST.
ROOM 812
TALLAHASSEE, FLORIDA 32399-1400
850-488-9330

EMAIL: OPC_WEBSITE@LEG.STATE.FL.US
WWW.FLORIDAOPC.GOV

J.R. Kelly
Public Counsel

August 1, 2008

RECEIVED-FPSC
08 AUG -1 PM 3:23
COMMISSION CLERK

Ann Cole
Commission Clerk and
Administrative Services
Room 100, Easley Building
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

Re: Docket No. 080006-WS

Dear Ms. Cole:

Enclosed for filing, on behalf of the Citizens of the State of Florida, are the original and 15 copies of the Revised Direct Testimony of James A. Rothschild.

Please indicate the time and date of receipt on the enclosed duplicate of this letter and return it to our office.

Yours truly,

Charlie Beck
Deputy Public Counsel

CJB:bsr

Enclosure

COM 5+1
ECR
GCL 1
OPC
RCP
SSC
SGA
ADM
CLK

DOCUMENT NUMBER-DATE
06774 AUG-1 08
FPSC-COMMISSION CLERK

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Water and Wastewater Industry Annual Reestablishment of Authorized Range of Return on Common Equity for Water and Wastewater Utilities pursuant to Section 367.081(4)(f), F.S.	)))))	Docket No. 080006-WS Filed: August 1, 2008

DIRECT TESTIMONY

OF

JAMES A. ROTHSCHILD

On Behalf of the Citizens of the State of Florida

J.R. Kelly
Public Counsel

Office of Public Counsel
c/o The Florida Legislature
111 West Madison Street
Room 812
Tallahassee, FL 32399-1400

Attorney for the Citizens
Of the State of Florida

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Water and Wastewater Industry Annual Reestablishment of Authorized Range of Return on Common Equity for Water and Wastewater Utilities pursuant to Section 367.081(4)(f), F.S.	)))))	Docket No. 080006-WS Filed: August 1, 2008

DIRECT TESTIMONY

OF

JAMES A. ROTHSCHILD

On Behalf of the Citizens of the State of Florida

J.R. Kelly
Public Counsel

Office of Public Counsel
c/o The Florida Legislature
111 West Madison Street
Room 812
Tallahassee, FL 32399-1400

Attorney for the Citizens
Of the State of Florida

TABLE OF CONTENTS

EXHIBITS

DIRECT TESTIMONY

OF

James A. Rothschild

I. STATEMENT OF QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is James A. Rothschild and my address is 115 Scarlet Oak Drive, Wilton, Connecticut 06897.

Q. WHAT IS YOUR OCCUPATION?

A. I am a financial consultant specializing in utility regulation. I have experience in the regulation of electric, gas, telephone, sewer, and gas utilities throughout the United States.

Q. PLEASE SUMMARIZE YOUR UTILITY REGULATORY EXPERIENCE.

A. I am the founder of Rothschild Financial Consulting and have been a consultant since 1972. From 1979 through January 1985, I was President of Georgetown Consulting Group, Inc. From 1976 to 1979, I was the President of J. Rothschild Associates. Both of these firms specialized in utility regulation. From 1972 through 1976, Touche Ross & Co., a major international accounting firm, employed me as a management consultant. Touche Ross & Co. later merged to form Deloitte Touche. Much of my consulting at Touche Ross was in the area of

utility regulation. While associated with the above firms, I have worked for various state utility commissions, attorneys general, utility customers and public advocates on regulatory matters relating to regulatory and financial issues. These have included rate of return, financial issues, and accounting issues. (See Exhibit JAR1 for Resume of James A. Rothschild)

Q. WHAT IS YOUR EDUCATIONAL BACKGROUND?

A. I received an MBA in Banking and Finance from Case Western University (1971) and a BS in Chemical Engineering from the University of Pittsburgh (1967).

II. BACKGROUND AND SUMMARY OF CONCLUSIONS.

Q. PLEASE EXPLAIN THE BACKGROUND AND OVERVIEW OBSERVATIONS FOR THIS CASE.

A. The Florida Public Service Commission is authorized by statute "... to establish not less than once each year, a leverage formula to calculate a reasonable range of return on equity (ROE) for water and wastewater (WAW) utilities." While the FPSC has provided the required annual updates to the leverage formula every year, an order establishing the procedures to be used for this update was last established by Order No. PSC-01-2514-FOF-WS in Docket No. 010006-WS, issued on December 24, 2001 ("2001 Order").

Q. PLEASE SUMMARIZE THE FINDINGS OF THE COMMISSION IN THE 2001 ORDER TO BE USED TO CALCULATE THE RATE OF RETURN ON EQUITY FOR WATER AND WASTEWATER UTILITIES.

A. The Commission addressed 5 points in its conclusion starting on page 20 of the 2001 Order that reflected the methodology it used to calculate the annual leverage formula. Those findings are as follows:

1. A two-stage annual DCF (Discounted Cash Flow) model shall be applied to an index of natural gas distribution utilities, using forecasted expected dividend growth rates for the first stage and the retention earnings method for the second stage.
2. The CAPM (Capital Asset Pricing Model) shall be used and applied to an index of natural gas distribution utilities, using an average utility beta derived from Value Line, and a market risk premium calculated by a simple DCF model using an average forecasted dividends and earnings growth rate.
3. A 20-basis point adjustment shall be made to each model to adjust for flotation cost allowance. In addition, a 10-basis point adjustment shall be made to the CAPM to adjust for quarterly compounded results.
4. The following adjustments shall be made to the average of the two models: a bond yield differential adjustment; a private placement

premium of 50 basis points; and a small-utility risk premium of 50 basis points.

5. The applied range of ROE for a WAW utility shall be from 40% equity to 100% equity. In addition, an adjustment to reflect the required equity return at a 40% equity ratio shall be included.

Q. WHAT WAS THE LEVERAGE FORMULA CALCULATED IN THE 2001 ORDER?

A. The Commission calculated leverage formula in 2001 was as follows:

Return on Common Equity = 9.10% + 0.896 / Equity Ratio (ER)

Range 10.00% @ 100% Equity to 11.34% @ 40% Equity

Q. HAS THE COMMISSION UPDATED THE FORMULA BETWEEN 2001 AND 2008?

A. Yes. The Commission has used the same methodology to update the leverage formula for the years 2002 through 2007. In the current docket, 080006-WS, the staff filed a recommendation on May 8, 2008, to update the leverage formula for 2008, which was addressed by the Commission at the May 20, 2008 Agenda Conference. Based on comments made by the Office of Public Counsel and other parties to the docket, the Commission denied staff's recommendation to establish a new leverage formula and set the matter for hearing.

Q. WHAT WAS THE LEVERAGE FORMULA RECOMMENDED BY STAFF IN ITS MAY 20, 2008 RECOMMENDATION?

A. The Staff recommended leverage formula for 2008 was as follows:

Return on Common Equity = 7.36% + 2.123 / Equity Ratio

Range: 9.48% @ 100% Equity to 12.67% @ 40% Equity

Q. ARE THERE ANY OVERVIEW OBSERVATIONS YOU BELIEVE NEED THE COMMISSION'S CAREFUL ATTENTION IN THIS CASE?

A. Yes. There are two critical observations that prove that Florida's leverage formula needs revision:

1. Staff's cost of equity recommendation increased between 2001 and 2008 even though interest rates declined over the same time period.

On May 8, 2008, Staff issued a recommendation that provides what it believes to be the current leverage formula results that are obtained from implementing the methodologies approved by the Commission in the 2001 Order. In this Order, the Commission determined that the cost of equity for a water and wastewater company with a common equity ratio of 40% would be 11.34% and 10.00% for a company with a common equity ratio of 100%. Staff's recommendation in this current docket reflected that the cost of equity applicable to a water or wastewater

company with a common equity ratio of 40% would be 12.67%, or 1.33% higher than the 11.34% cost of equity found appropriate by the Commission in 2001. Long-Term interest rates have decreased from 2001 to 2008 and the cost of equity tends to follow these rates so this very large increase the cost of equity range in the leverage formula goes against market trends. Long-term interest rates as measured by long-term treasury bonds averaged 5.46% in 2001, and varied between 5.22% and 5.45% during March 2001[1]. During the March 2008 month used by Staff for stock prices in its current recommendation, the interest rate on U.S. treasuries varied between 4.16% and 4.61%. Between the 2001 leverage formula finding made by this Commission and Staff's updated determination of the findings in that prior decision, long-term U.S. treasury interest rates dropped by about 0.95%. As stated earlier, with such a large drop in long-term interest rates, one should be highly confident that the cost of equity has also dropped. An increase in the computed cost of equity in the face of such a large drop in interest rates should be carefully analyzed. It is a strong indication that something must be wrong with the underlying computations that develop the leverage formula. Later in this testimony I will show that this improper result from the updated leverage formula is primarily due to severe deficiencies in the approach to the CAPM that has been used to develop the leverage formula.

2. There is too great a change in the cost of equity for a given change in the common equity ratio.

[1] Obtained from Yahoo Finance by retrieving historical prices for the long-term U.S. treasury index that is obtainable by entering the symbol ^tyx.

In its May 8, 2008 recommendation, Staff has recommended that the leverage formula now become 7.36% + 2.123/Equity Ratio (ER). This is very different from the formula of 9.10% + 0.896/ER that was approved by the Commission in its 2001 Order. The 2008 proposed formula puts a much greater emphasis on the ER impact than did the original. As such, the change in the common equity ratio from company to company has a much larger impact on the cost of equity calculated in the 2008 version than it did in the 2001 version. For both the 2001 ordered and the 2008 staff recommended formulas to be correct (calculated pursuant to the method approved per the 2001 Order), the financial markets would have to have changed dramatically. The cost of equity would now be much more sensitive to changes in the equity ratio of a company.

Below is a comparison of the 2001 and 2008 recommended differential included in the leverage formulas between 40% and 100% common equity ratios:

Cost of Equity Spread	2001	2008
a) At 40%	2.24	5.308
b) At 100%	0.896	2.123
c) Spread between 40% and 100% ER	1.34%	3.185%

In the 2001 Order, a 1.34% reduction in the cost of equity as a company increased its common equity ratio from 40% to 100% resulted in an average decrease in the

cost of equity of 0.022% for each 1% increase in the percentage of common equity in the capital structure. Using the leverage formula that Staff recommended for 2008, would result in an average reduction in the cost of equity of 0.053% for each 1% increase in the common equity ratio. If approved, this would make the new adjustment rate 140% larger than it was when the current procedures were originally established.

Q. DOES THE CURRENT LEVERAGE FORMULA METHODOLOGY TAKE INTO ACCOUNT THE CHANGE TO THE COST OF DEBT IN RESPONSE TO CHANGES IN THE LEVEL OF COMMON EQUITY IN THE CAPITAL STRUCTURE?

No it does not. Later in this testimony, I will show that the huge difference in the computed rate of change in the cost of equity in response to capital structure changes when computed in 2008 versus when it was computed in 2001 is NOT due to a real change in the relationship between capital structure and the cost of equity. Instead, the problem is caused by the failure of the leverage graph computation to change the cost of debt in response to changes in the level of common equity in the capital structure.

Q. DOES THE COST OF EQUITY AND THE COST OF LONG-TERM DEBT CHANGE IN THE SAME DIRECTION AND IN APPROXIMATLY THE SAME MAGNITUDE OVER TIME?

A. Yes it does. Equity and debt both compete for investment funds at different risk levels. When interest rates decrease investors have to buy stocks if they want to maintain their retirement plans or other financial goals. This flow of money into equities drives up stock prices and thus reduces the cost of equity to companies.

Q. IN ADDITION TO PROBLEMS THAT SHOW UP FROM THE OBSERVATONS OVER TIME THAT YOU HAVE DISCUSSED ABOVE, ARE THERE ANY OTHER ASPECTS OF THE LEVERAGE GRAPH DETERMINATION THAT SHOULD BE RECONSIDERED BY THE COMMISSION?

A. Yes. I will explain later in this testimony why the 2 stage DCF model to calculate the cost of equity should be modified and why the market risk premium calculated by a simple DCF model for the CAPM is inappropriate. Further, the use of cost of capital "adders" for the "Bond Yield Differential", "Private Placement Premium", "Small-Utility Risk Premium and "Financing Costs" are all improper and should be eliminated from the leverage graph procedure. In addition, the current formula does not consider the impact in the second stage of the DCF model for the increment to growth caused by sales of new common stock above book value.

Q. PLEASE DESCRIBE HOW THE CURRENT LEVERAGE FORMULA IS CALCULATED.

3A. First, the Commission calculates cost of equity for an average Florida water and wastewater company using a proxy of natural gas distribution companies. To do this, the Commission determines the DCF and the CAPM cost of equity for the gas companies and averages those two percentages. It then adds a bond yield differential, a small-utility risk premium, a private placement premium, and then adjusts these percentages to reflect a 40% equity ratio. To allow the cost of equity to be adjusted based on the amount of equity in a given company, a formula is created using the equity ratios of the gas companies and a debt cost rate for the Baa3 bond rate plus a 50 basis point private placement premium, a 50 basis point small-utility risk premium and 39 basis points for a bond yield differential. The formula is D + SF/ ER, where both D (debt cost rate) and SF (equity spread factor) are held constant. Thus, the only variable in the equation is the equity ratio for the individual company to which the formula is applied.

Q. DO YOU AGREE WITH USING THE FIRST COMPONENT IN THE CURRENT ROE FORMULA OF USING A TWO STAGE DCF MODEL FOR GAS COMPANIES?

A. Yes, for the most part, this component of the formula is sound. The core of the DCF method applied to the gas companies is a two-stage approach and separately discounts the forecasted dividends and the future expected stock price based upon anticipated retention (or b x r). As I will elaborate on later in my testimony, while the method is basically sound, several modifications could improve the accuracy of the method Staff has applied to gas companies.

Q. DO YOU BELIEVE THAT USING A SIMPLE DCF MODEL TO CALCULATE THE RISK PREMIUM IN THE CAPM IS INAPPROPRIATE?

A. Yes. The DCF calculation used to determine the risk premium in the CAPM model is substantially different than the two-stage DCF approach discussed above. The result of using the simplified DCF model for calculating the CAPM is seriously flawed. This flaw causes the CAPM result to change significantly for reasons other than real changes in the cost of equity. This entirely different approach to the DCF method used as a key component to implementation of the CAPM method produces unreliable, inconsistent results because it uses unsustainable growth rates in a form of the DCF model that only makes sense if a long-term sustainable constant growth rate is used.

Q. **PLEASE SUMMARIZE YOUR RECOMMENDED CHANGE TO THE LEVERAGE FORMULA.**

A. I believe that the current equity leverage formula as it exists today is flawed in several areas and should be updated. The leverage formula should take a somewhat different form than was used in the past. The change is required because the cost of debt as well as the cost of equity changes as the level of common equity in the capital structure changes.

The cost of equity that should be allowed to a water or wastewater company with the same 49.12% common equity ratio being used by the average of the gas utility

companies is 9.40%. This is based upon a DCF indicated cost of equity of 9.42% to 9.43% (See Exhibit JAR-2) applicable to the comparative group of gas utilities obtained from averaging the DCF result of 9.43% with the CAPM result of 9.37% (Exhibit JAR-3, page 1) applied to the gas utilities, which averages 9.40%.

Q. WHAT IS YOUR NEW RECOMMENDED LEVERAGE FORMULA?

A. The newly approved leverage formula should be:

$$k = (OCC - D\,(1-ER))/ER$$

where

k = cost of equity

D = cost of debt, determined as a function of the percentage of equity in the capital structure

OCC = overall cost of capital

ER = Equity ratio

I recommend the impact of both Florida and federal income taxes should be included and that the value for the OCC term should be 10.610562% and the resultant solution for k should be multiplied by 1 minus the tax rate. See Exhibit JAR-4, Page 1. The combined Florida and federal tax rate is 38.575% as also shown on Exhibit JAR-4, Page 1. The value for "D", or the cost of debt, should be equal to the 6.08% cost of debt applicable to a capital structure with 49.12% as determined by Staff (A2 bond rate from Staff Recommendation), minus 0.0197%

for each 1% decrease in the level of debt in the capital structure, or plus 0.0197% for each 1% increase in the level of debt in the capital structure.

Q. WHAT WOULD BE THE STEPS REQUIRED TO UTILIZE THE NEW LEVERAGE FORMULA YOU ARE PROPOSING?

A. The following would be done annually:

1. Calculate the cost of equity for a comparative group just as done today (As explained in my testimony I am proposing revising the DCF and CAPM methods being used).

2. Calculate the cost of debt for the comparative group. This should be calculated as the leverage graph is currently calculated by estimating the bond rating of the comparative group and looking up the corresponding bond yield for this rating.

3. Use the average capital structure ratios of the comparative group to calculate the Overall Cost of Capital (OCC). This is done by multiplying the cost of equity and the cost of debt by their prospective percentages in the capital structure just as it is done currently.

Q. HOW WOULD YOU APPLY YOUR FORMULA TO A SPECIFIC COMPANY?

A. The following would be done to calculate the cost of equity for individual water companies asking for rate increases during the year:

1. Calculate the cost of debt for the company by adding or subtracting 0.0197% for every 1% difference in the percentage of debt in the company's capital from the comparative group's capital structure.

2. Just as done today keep the OCC the same as the comparative group.

3. At this point all the variables required to utilize my proposed leverage formula are known: OCC, Equity Ratio (ER) and Cost of Debt.

4. Plug these values into the following formula: $k = (OCC - D(1-ER))/ER$.

   a. OCC is Overall Cost of Capital (same as the comparative group)

   b. D is the cost of debt that is calculated for each individual company

   c. ER is the equity ratio that is provided by each individual company

   d. k = the computed cost of equity for individual company

Q. PLEASE PROVIDE AN EXAMPLE OF HOW YOUR PROPOSED FORMULA WOULD BE USED?

A. As explained above my proposed procedure starts by calculating the OCC of a comparative group annually.

Annual portion:

1. Calculate the cost of equity of the 10 gas companies in the proxy group to be 9.40%. (See my DCF and CAPM sections of my testimony)

2. Based on average bond rating of comparative group calculate this cost of debt to be 7.36%. (Same as done by staff in Docket No. 080006-WS)

3. Using the average capital structure of comparative group calculate the OCC. In this case it is 8.45% as shown below:

Marginal Cost of Investor Capital

Average Water and Wastewater Utility			Weighted
		Marginal	Marginal
Capital Component	Ratio	Cost Rate	Cost Rate
Common Equity	46.37%	9.40%	4.36%
Total Debt	53.63%	7.63%	4.09%
Total	100.00%		8.45%

To calculate the cost of equity for the individual water company, you would use the following methodology:

1. Assume that the water company's common equity ratio (ER) is 65%.
2. We would then be able to calculate their cost of debt to be 7.41%.
   a. This is calculated by taking the difference between this company's ER of 65% and the comparative group's ER of 53.63% and multiplying this difference by 0.0197%. This calculation equals 0.22%. Since this company's ER (65%) is higher than the comparative group's (53.63%) we subtract this 0.22% from the comparative group's cost of debt to get the 7.41%.
3. At this point we have all the variable needed to calculate this company's cost of equity (k).
   a. OCC = 8.45% (same as comparative group)
   b. ER = 65.00% (provided by company)
   c. Cost of debt = 7.41% (calculated above)

4. Enter all this variable into the formula k = (OCC-D (1-ER))/ER

a. k = (.0845 - .0741% (1- .65))/.65

b. k = 9.01%

III. IMPROPER COST OF EQUITY CHANGE

Q. **EARLIER IN THIS TESTIMONY, YOU STATED THAT THE COST OF EQUITY SPREAD HAS INCREASED BY 133 BASIS POINTS FROM 2001 TO 2008 (11.34% TO 12.67%). YOU ALSO EXPLAINED THAT THIS INCREASE OCCURRED OVER A TIME WHEN INTEREST RATES HAD FALLEN BY 95 BASIS POINTS OVER THE SAME TIME PERIOD. WHAT DEFICIENCIES IN THE LEVERAGE FORMULA METHODOLOGY LEADS TO THIS IMPROBABLE RESULT?**

A. As previously explained, the problem is caused by the use of a simple average DCF model to calculate the market risk premium used in the CAPM method. The stand alone DCF method, as applied it to the gas utilities, is not the source of the problem. Attachment 1 to Staff's May 8, 2008, recommendation shows that the "DCF ROE for Natural Gas Index" was found to be indicating a cost of equity of 9.68%. In the 2001 Order, the DCF model reflected a cost of equity of 10.81%. A drop in the cost of equity of 1.33% (from 10.81% in 2001 to 9.68% in May 2008) is reasonable considering that over the same time period long-term interest rates dropped by 0.95%. The correlation between the DCF indicated cost of equity and long-term interest rates is even more precise when the common equity ratio of

the Natural Gas Index is considered. In 2001, the average common equity ratio of the gas utilities was 42.79% (Page 29 of the 2001 Order), but has increased to 46.37% as of May 2008. This increase in the common equity ratio of the index indicates that the cost of equity should have decreased more than the drop measured by the lowering of long-term interest rates.

The DCF result obtained by Staff when applying it to the comparative gas companies shows an ability of that version of Staff's DCF to reflect changes in capital markets because, as expected, the cost of equity indicated by that version of the DCF method decreased along with interest rates between 2001 and 2008.

However, the cost of equity calculated with the CAPM approach, which included the DCF model used to measure market risk premium, failed this consistency test. Not only was the predicted magnitude of the change way off, but the results were so bad that it even was wrong about the direction of the change. Back in 2001, the CAPM approach that relied on the erroneous form of the DCF model yielded an indicated cost of equity of 9.08%[2], while the result of applying the same approach in 2008 produced a result of 11.40%[3]. In other words, over the same time period that the interest rate on long-term treasuries declined by 0.95% the CAPM approach erroneously measured that the cost of equity has actually increased by 2.38%. By any measure, this CAPM result is contrary to financial theory.

[2] Page 24 of the 2001 Order in Docket No. 010006-WS
[3] Attachment 1, Page 1 of May 8, 2008 Staff Recommendation

Q. **WHAT CAUSES THE CAPM APPROACH TO PRODUCE RESULTS CONTRARY TO FINANCIAL THEORY?**

A. The CAPM approach incorporates a DCF calculation to estimate the market risk premium component, but this DCF calculation used by staff in the CAPM approach is different from the DCF calculation used to independently estimate the cost of equity for the comparative gas companies. The DCF method applied to the comparative gas companies uses a two-stage approach whereby growth in the second stage is quantified using the retention growth (b x r) method. While the CAPM method is also dependent upon a DCF result to compute the risk premium, growth in the CAPM implementation of the DCF method is not based on the two-stage approach, but is instead computed by Staff by averaging the five year growth rate in dividends and earnings forecast by Value Line (based on over 600 companies) to occur between the average of the three most recent historical years and a three year period a few years into the future.

As I have argued for decades, these historical to short-term future five-year growth rates are NOT the kind of growth rate applicable for use in the DCF formula because they are not long-term sustainable growth rates. Growth rates from any base period are subject to distortion depending upon how atypical the three-year average base period is compared to what is expected for the future. Value Line itself apparently knows better than to use these growth rates in a DCF method, because when it advises investors what total return to expect for the future, it does NOT add these growth rates to the dividend yield as it would do if

it believed those growth rates to be credible in a DCF approach. Therefore, I am not surprised that the results of such an inherently flawed approach to the DCF would result in vastly inconsistent results when comparing the computational results from 2001 with those for 2008.

Q. **DO YOU HAVE ANY EMPIRICAL SUPPORT WHICH SHOWS THE INAPPLICABILITY OF THE DCF APPROACH USED IN THE DEVELOPMENT OF THE CAPM METHOD?**

A. Yes. When the results from Staff's recommendation of the DCF that it used in its CAPM method are graphed against the beta for 650 of the 657 companies used by staff in its analysis, it looks like a "shotgun shot," indicating that there is at best a very loose correlation between risk and return. See Exhibit JAR-5

Q. **WHAT IS BETA?**

A. Beta is a measurement of the correlation between a given stock and the market as a whole. A portfolio made up of companies with a beta that averages 1.0 tends to have price swings that match the market in magnitude. A portfolio with an average beta of 1.5 tends to move 1.5% for every 1% the market moves. A portfolio with average beta of 0.8 tends to move 0.8% for every 1% the market moves.

Q. DID YOU ADD A TRENDLINE TO THE DCF INDICATED RESULTS COMPARED TO A BETA GRAPH?

A. Yes. The straight line shown on the graph is a least-squares trendline. This trendline is upward sloping, which means that the approach is at least good enough to be able to observe that the cost of equity does increase as the beta increases. However, the slope of the line is way too gradual. In fact, if the line is projected to the point where a riskless security, such as U.S. treasuries, would be expected to appear (with a beta of zero), the graph as defined by these simple DCF model results would conclude that a riskless security should be expected to yield a return of approximately 11%. Since all U.S. treasuries, regardless of term, are currently yielding far less than 11% the DCF method using short-term earnings and dividends to compute growth is currently materially overstating the cost of equity

Q. WHY DID YOU GRAPH ONLY 650 OF THE 657 COMPANIES?

A. It was necessary to exclude seven companies because there was no beta available for those companies. All other companies were included.

Q. GIVEN THE FINANCIAL CHAOS THAT RESULTS FROM IMPLEMENTATION OF THE CAPM MODEL, DO YOU RECOMMEND AN APPROACH TO THE CAPM THAT COULD BE HELPFUL TO THE COMMISSION?

A. Yes. Recognizing that 2001 Order approach to the CAPM is so flawed it must be rejected, I recommend using the approach to the CAPM that I present later in this testimony. As shown on Exhibit JAR-3, Page 1, and discussed later in this

testimony, the results of this supportable approach to the CAPM is currently producing an indicated cost of equity to the gas utility group of 9.37%. This 9.37% CAPM result is consistent with both my DCF result of 9.42% to 9.43% and Staff's DCF result of 9.68%. While Staff's DCF result is reasonably close to the results I obtained from both the DCF and CAPM approaches, a large part of the difference is attributable to Staff's allowance for financing costs.

IV. COMMON EQUITY RATIO AND COST OF EQUITY.

Q. **HOW DOES THE CURRENTLY APPROVED LEVERAGE FORMULA CONSIDER THE IMPACT CAPITAL STRUCTURE HAS ON THE COST OF CAPITAL FROM COMPANY TO COMPANY?**

A. The currently approved leverage formula correctly recognizes that the cost of equity experienced by a water or wastewater company is influenced by the capital structure management has implemented. Financial risk, which is part of the non-diversifiable risk experienced by a company, goes up as the percentage of common equity in the capital structure goes down. However, it improperly fails to recognize that the cost of debt also increases as the common equity ratio decreases.

Q. **ABSENT TAXES AND THE COST OF BANKRUPCY RISK, DOES CAPITAL STRUCTURE AFFECT THE OVERALL COST OF CAPITAL OF A COMPANY?**

A. No. The work done by Professors Modigliani and Miller, both of Carnegie Mellon University is generally regarded as the breakthrough work on the relationship between capital structure and the cost of both debt and equity. An excellent write-up on Modigliani and Miller's work I obtained from Wikipedia can be found in Exhibit JAR-6[4]. Modigliani and Miller showed that if it were not for income taxes and bankruptcy risk, the capital structure selected by a company would have no impact on the overall cost of capital. As the common equity ratio increases both the cost of debt and equity increase. However, at the same time the cost of equity and the cost of debt increases, the impact of the higher component cost is fully offset by the reduced use of the more expensive equity component. If a utility commission were to properly establish the cost of capital using a capital structure with 40% equity and 60% debt, the proper cost of capital would not change even if the company subsequently issued new equity to pay off all of its debt and become a company with 100% equity.

Q. SHOULD THE COMMISSION BE CONCERNED ABOUT WHAT CAPITAL STRUCTURE MANAGEMENT IMPLEMENTS?

A. Yes. This responsibility to protect ratepayers from excessive income tax expense changes everything. The way corporate income taxes are computed, the interest expense paid to bondholders is deductible while the income earned on the common stock is not deductible. Therefore, if a company's cost of capital

[4] While Wikipedia often provides information that is quite accurate, because it is not subject to an independent check by experts, Wikipedia should always be used with care. In this case, I have presented the Wikipedia information because I found it be a particularly good write-up of exactly what I was planning to say in my testimony.

consists of $1,000 to pay its interest expense and another $1,200 to provide a return to its equity investors, the total amount of revenues the company has to collect from ratepayers to pay bondholders the $1,000 of interest is $1,000. But, a corporation paying the standard 35% federal income tax rate has to collect $1,846 and use $646 of this $1,846 to pay income taxes, which leaves $1,200 as earnings on its equity capital. It is because investor owned water and wastewater companies do have to pay income taxes that the overall cost of capital becomes too high if a company uses an excessive percentage of common equity in the capital structure. The Commission should be concerned that a company prudently do what it can to lower its income tax expenses. Investors might not care if these taxes are paid for by ratepayers, but the Commission should care that ratepayers not be charged income taxes that a company could reasonably have avoided.

Q. WHEN DETERMINING HOW THE COMMISSION SHOULD ALLOW THE COST OF EQUITY TO CHANGE IN RESPONSE TO CHANGES IN THE PERCENTAGE OF COMMON EQUITY IN THE CAPITAL STRUCTURE, WHICH OVERALL COST OF CAPITAL SHOULD THE COMMISSION HOLD CONSTANT: THE COST OF CAPITAL BEFORE CONSIDERATION OF INCOME TAXES OR THE ONE AFTER CONSIDERATION OF INCOME TAXES?

A. If the goal of the Commission is to compute the cost of equity as experienced by the equity investors, then the overall cost of capital that should be held constant is the one determined prior to consideration of income taxes. If the goal of the

Commission is to require water or wastewater companies to set a capital structure that reasonably approximates the most efficient capital structure, then the Commission should quantify a leverage formula based on a constant cost of capital AFTER considering the revenue requirements for income taxes. Since a company is only entitled to recover prudently incurred costs, absent a showing of why a particular company cannot finance its rate base with a reasonable amount of debt, a company is therefore only entitled to charge ratepayers for a leverage formula determined cost of capital that considers the real world impact of taxes. If there is a company with a special situation that when presented to the Commission could explain why it is appropriate for it to use an excessively high level of common equity in the capital structure, it could ask the Commission to give it a return in excess of the amount determined by the leverage graph. Without such a showing, it would be inappropriate to charge ratepayers the higher cost of an inherently inefficient capital structure.

Q. HOW DID YOU DERIVE THE LEVERAGE FORMULA YOU ARE RECOMMENDING?

A. The derivation of the formula is straight-forward. The overall cost of capital (OCC) is known to be equal to the sum of the weighted cost of equity and the weighted cost of debt:

$$OCC = EQ \times k + (1\text{-}ER) \times D$$

Solving the above equation for k results in the recommended leverage formula.

$k = (OCC - D\ (1\text{-}ER))/ER$

where

k = cost of equity

D = cost of debt, determined as a function of the percentage of equity in the capital structure

OCC = overall cost of capital

ER = Equity ratio

Since the cost of debt, D, is not a constant but is a function of the percentage of debt in the capital structure (see Exhibit JAR-4, Page 3), the value input for D when solving the equation must be computed. (To see how the cost of debt is calculated see the example of how my proposed formula would be used.)

Q. **DOES THE DATA SHOW THAT THE COST OF DEBT CHANGES AS THE PERCENTAGE OF DEBT IN THE CAPITAL STRUCTURE CHANGES?**

A. Yes. This is not only consistent with the same Modigliani & Miller principle that is the basis for the leverage formula, but the relationship between capital structure and cost of debt is confirmed by the actual data associated with the gas company comparative group. The actual relationship between bond ratings and capital structure is shown in the graph on Exhibit JAR-8, page 2.

Q. **WHAT VALUE IS USED FOR THE OVERALL COST OF CAPITAL (OCC)?**

A. With consideration of income taxes, the formula being applied for the value of OCC should be 10.610562%, shown on Exhibit JAR-4, Page 2. This value for OCC represents the overall cost of capital with the equity component grossed up to account for income taxes. Since the regulatory process charges ratepayers for income taxes, it is this value of OCC that reflects the actual charges that would be experienced by ratepayers.

Q. **COULD YOU PRESENT A TABLE THAT COMPARES THE RESULTS OBTAINED BASED ON THE FORMULA THAT INCLUDES INCOME TAXES?**

A. Yes:

Percent Common Equity	Return on Equity Considering Income Taxes
40%	10.53%
49.12%	9.40%
60%	8.46%
100%	6.52%

In the above table, the 49.12% is the actual average common equity ratio being used by the comparative gas companies. See Exhibit JAR-8, Page 1.

Q. **IS THE 6.52% RESULT YOU OBTAINED BASED ON THE LEVERAGE FORMULA THAT INCLUDES THE IMPACT OF TAXES FOR A COMPANY WITH 100% COMMON EQUITY EQUAL TO THE COST OF EQUITY FOR THAT COMPANY?**

A. No. A water or wastewater company that is financed with 100% common equity is using an overly expensive common equity ratio. It is overly expensive because such a company would be receiving no benefit whatsoever from the deductibility of interest expense. As a result, its income tax expense charged to ratepayers would be especially large. The 6.52% return on equity represents the allowed return that would be reduced to offset what otherwise would be an especially high effect of the cost of capital because of the missing interest deduction. The version of the formula that fails to include the effect of income taxes would NOT make the capital structure selected indifferent to ratepayers. If this formula that fails to consider income taxes were to be used to set rates, then revenue requirements borne by ratepayers would go up even if the return on equity was set in such a way that this net of tax value of OCC were held constant. This is because the greater the percentage of common equity in the capital structure, the greater the equity component's weighted cost of capital and the greater the equity components weighted cost of capital, the higher the income tax burden that is charged to ratepayers.

Q. **DID YOU PRODUCE A SCHEDULE SHOWING HOW THE COMPUTATION OF THE COST OF DEBT CHANGES AS THE PERCENTAGE OF DEBT IN THE CAPTIAL STRUCTURE CHANGES?**

A. Yes. Exhibit JAR-4, Page 3, shows how the cost of debt is computed to change as the percentage of debt in the capital structure declines from 60% of total capital down to 45% of total capital. Over this range, the cost of debt is computed to gradually drop from 6.26% at 60% debt down to 5.96% at 45% debt. It also shows that, based on this formula, the cost of debt would be estimated to decline to 5.08% for a company with 100% equity.

III COST OF EQUITY ADDERS

Q. **THE 2001 ORDER INCLUDES SEVERAL ADDERS TO THE COST OF EQUITY WHEN DETERMINING THE LEVERAGE FORMULA. WHAT IS YOUR REACTION TO THESE ADDERS?**

A. The 2001 Order allows for additions to the cost of equity computed from the comparative gas companies for:

Bond Yield Differential

Private Placement Premium

Small-Utility Risk Premium

Financing Costs

I believe that all the above adders are inappropriate. However, one adder which is actually larger than any of the other ones and was omitted but should have been included in the second stage of the DCF model is the increment to growth caused by sales of new common stock above book value. After excluding the four above-listed improper additions to the cost of equity and adding the impact of sales of new common stock above book value, the results of the DCF method as applied to the comparative gas companies changes from the 9.68% obtained by Staff [5] to the 9.42% to 9.43% shown on my Exhibit JAR-2.

Q. **WHY IS THE BOND YIELD DIFFERENTIAL ADJUSTMENT IMPROPER?**

A. When a company issues a bond, the bond yield or interest expense a company has to pay on its bond is related to the risk bond investors perceive that is associated with the bond. The bond ratings issued by the major bond rating agencies are generally consistent with the risk of investing in a bond as perceived by bond investors. While numerous factors go into the determination of a bond rating, important factors such as the coverage ratio and internal cash generation are highly influenced by the capital structure, i.e. the degree of leverage used by a company. Coverage ratio is computed from the following formula:

Income available to equity + income taxes + Interest expense

[5] Staff Recommendation of May 8, 2008, Attachment 1, Page 1.

Interest Expense

When a company increases the percentage of total financing done by debt, the interest expense goes up. Also, because of the higher interest expense and the fewer dollars of equity, both the income available to equity and the associated income taxes goes down. As can be seen from the above formula, higher interest expense, lower income available to common and lower income taxes all result in a lower coverage ratio. This is why the cost of debt incurs upward pressure when a company uses a higher proportion of debt in the capital structure. This higher interest expense is exactly the same factor that causes an increase in the risk experienced by the equity holders. This increase in the risk experienced by the equity holders is precisely the risk that the leverage formula is measuring. Therefore, adding a factor for the anticipated higher cost of debt is a double-count.

Q. **DO YOU HAVE DATA TO SHOW THAT THE BOND RATING GOES DOWN AS THE PERCENTAGE OF DEBT IN THE CAPITAL STRUCTURE GOES UP?**

A. Yes. Earlier in this testimony I presented a graph that shows the relationship between the bond rating and the percentage of equity in the capital structure. Since the percentage of debt goes down as the percentage of equity goes up, that same graph also shows that the bond rating goes down as the percentage of debt goes up.

Q. WHY HAVE YOU NOT PROPOSED AN ADDITION FOR A PRIVATE PLACEMENT PREMIUM?

A. There are a sufficient number of investors such as retirement funds and life insurance companies that plan to hold an investment to maturity that there is no reason to expect a private placement premium. Even if such a premium should somehow exist for a bond issuance, it does not necessarily follow that such a premium would apply to a common equity investment.

I attempted to find studies that evaluated the cost difference between private placement and public placement debt. The only one I was able to find is a Working Paper entitled "Financial Contracting and the Choice between Private Placement and Publicly Offered Bonds" dated November, 2004 and done by Simon H. Kwan of the Economic Research Department of the Federal Reserve Bank of San Francisco and Willard T. Carleton of the Department of Finance at the University of Arizona. [6] This one study I could find concluded that "Finally, we find evidence that borrowers self-select their debt issuance choice to minimize financing costs. However, switchers that issue debt in both markets do not realize significant cost savings by issuing bonds in the private market."

I find it both noteworthy and consistent with my own experience in the area that

[6] The paper states on page one that "The views in this paper are solely the responsibility of the authors and should not be interpreted as reflecting the views of the Federal Reserve of San Francisco or Board of Governors off the Federal Reserve System.

the private placement alternative is selected not as a mechanism for higher cost, but is used when the borrower perceives an opportunity to experience a lower cost of debt.

Q. PLEASE COMMENT ON THE SMALL UTILITY RISK PREMIUM.

A. First, building in a small utility risk premium to the leverage formula is wrong because not all companies to which the leverage formula could be applied are small. Second, financial theory explains why there shouldn't be a small company premium and empirical review of financial data shows that financial theory is correct: there is no small company premium.

Q. PLEASE EXPLAIN THE FINANCIAL THEORY REFERRED TO ABOVE?

A. The theory is that investors demand compensation only for the risk a company has in relation to the overall market. As can be seen on Exhibit JAR-3, small companies have provided higher returns since 1926 but the can be explained by higher betas (correlations to the market). The graph shows 10 groups of companies, with the size of the companies going from largest to smallest from left to right. Therefore the data indicates that if a small company has a lower beta it would also have a lower expected return and thus there is no reason for a small company to require a higher return just because of its size.

Q. PLEASE COMMENT ON THE ADDITION FOR FINANCING COSTS.

A. In the 2001 Order, the Commission provided an allowance for financing costs by using a stock price that was 4% lower than the actual stock price. While it might be true that the net proceeds from the sale of new common equity, after paying underwriters fees, is somewhere in the range of 4% less than the market price, this adjustment is improper because much of the actual common stock raised by a company is raised via retained earnings. Equity raised via retained earnings has no financing cost. Additionally, when the stock price is materially above book value, financing costs are more than offset by the accretion that results when stock is sold above book value. As shown on Exhibit JAR-9, Page 1, the average and median market-to-book ratio for this natural gas comparative group is 2.45 and 2.00, respectively. At such a high market to book ratio, selling stock above book value provides a substantial net benefit to investors. This benefit has already been quantified on Exhibit JAR-2 as a factor which already is expected to contribute over 2% per year of earnings per share growth. That adjustment fully accounts for the impact of financing costs and should not be added back into the leverage formula.

VI. DISCOUNTED CASH FLOW METHOD (DCF)

Q. **WHAT IS THE DISCOUNTED CASH FLOW (DCF) METHOD?**

A. The DCF method is a mathematical formula that is used to value a stock and to calculate the cost of equity. It recognizes that investors who buy a stock do so to receive cash dividends and/or capital gains in the future, considering the time

value of money. If a company offers an investor $100 in ten years or $80 today, the DCF method helps answer the question of which amount the investor should take. If the only investment opportunity for the investor is to put the money in a bank earning 3% interest, it is known that $100 in ten years is equivalent to $74.40 today ($100/(1.03)^10). The DCF method guides the investor to the correct answer, which is to take the $80 because it is higher than the $74.40. In the above example the discounted cash flow (DCF) method discount rate was 3%.

Q. **IS THE DISCOUNT RATE HIGHER WHEN AN INVESTOR VALUES A STOCK THAN WHEN INVESTING IN AN FDIC INSURED BANK ACCOUNT?**

A. Yes. The FDIC insured bank account is virtually certain to pay the interest and not default on the investor's deposit. On the other hand investing in stocks involves risk because the quality of management, competitive surprises or overall economic conditions all impact a company's ability to generate cash flow in the future.

Q. **WHAT IS THE RELATIONSHIP BETWEEN THE DISCOUNT RATE AND THE COST OF EQUITY?**

A. The discount rate investors' use when calculating the value of a stock is equal to the cost of equity. Investors receive their return on equity through dividends paid and when the stock is sold. The profit investors receive from selling stock is generally referred to as capital gains.

Q. **IS IT ACCEPTABLE TO ARRIVE AT A COST OF EQUITY FROM THE DCF MODEL THAT COULD CAUSE THE STOCK PRICE OF A COMPANY TO CHANGE?**

A. Yes. This principle is a key point of the City of Cleveland vs. Hope Natural Gas U.S. Supreme Court decision. In this landmark case, the U.S Supreme Court said:

> The fixing of prices, like other applications of the police power, may reduce the value of property which is being regulated. But the fact that the value is reduced does not mean that the regulation is invalid. It does, however, indicate that "fair value" is the end product of the process of rate-making not the starting point.... The heart of the matter is upon "fair value" when the value of the going enterprise depends on earnings under whatever rates may be anticipated.

Q. **WHAT IS THE PRINCIPLE BEHIND THE DCF METHOD?**

A. An investor parts with his or her money to receive dividends and then sells the stock to someone else. The price the new owner is willing to pay for the stock is related to the future flow of dividends and future selling price he or she expects to receive. The value of a company is recognized to be the discounted value of all future dividends continuing until the stock is sold, plus the value of the stock sale proceeds when it is eventually sold.

For example, if the cost of equity is 9% and the dividend is $1 per share then that one-dollar dividend paid out next year is worth $1/(1+.09) or $0.92 today. This means that the $0.92 of the current stock price is accounted for by the dividend expected to be paid one year from today. In addition to receiving a dividend for next year an investor might also expect a dividend in the second year of owning the investment. If that dividend were also $1 then in terms of today's value of that dividend in the second year that $1 is now worth $1/ (1.09) ^2 = $0.84. If by the third year it is expected the dividend will jump to $1.50 then the contribution to today's stock price from this $1.50 is $1.50(1.09)^3 = $1.16. This analysis continues year by year for as many years as the investor expects to own the stock. This relationship can be generalized by the following mathematical equation:

The current stock price P is equal to:

$$D1/(1+k) + D2/(1+k)^2 + D3/(1+k)^3 + \ldots (Dn + Pn) \text{ X } (1+k)^n.$$

P = Current stock price

D1 = Dividend paid out in the first year

D2 = Dividend paid out in the second year

D3 = Dividend paid out in the third year

Dn = Dividend paid out in the nth year

k = the opportunity cost of capital or the required return.

Pn = the sale price of the stock

This complex version of the DCF equation can be used to solve for the cost of equity by estimating the dividend each year and what price the stock will be sold for and then having the computation solve for the cost of equity, k.

Q. **DOES THE POTENTIAL FOR A CHANGE IN THE FUTURE EXPECTED RETURN ON BOOK EQUITY MAKE THE DCF MODEL CIRCULAR?**

A. No. It is not circular because the DCF computations are all taken from a point in time before investor expectations change. Such an approach is therefore no more circular than a ship captain who, by looking at his compass, determines that his ship is sailing 10 degrees too far south, so he turns the ship to have the very same compass turn back to the true course.

Q. **IS IT ALWAYS NECESSARY TO USE THIS COMPLEX FORM OF THE DCF METHOD?**

A. No. If the best estimate for future growth in earnings, book value, dividends and stock price is the same estimate then and only then does the complex formula becomes mathematically identical to the answer obtained by the following equation:

$k = D/P + g.$

Q. **WHAT IS THE SIMPLIFIED VERSION OF THE DCF METHOD?**

A. In the simplified version the cost of equity k is equal to the dividend yield plus growth.

$k = D/P + g$

k = Cost of equity

D/P = Dividend Yield (D = dividend and P = stock price)

g = Growth in earnings, dividends, book value and stock price expected by investors.

In the mathematical derivation of this simplified DCF model growth, g = Future Expected Return on Book Equity (ROE) X Retention Rate + SV. SV is the growth caused by the sale of new common stock at a price different from book value.

The retention rate is the percentage of earnings not paid out as a dividend. If a stock price is $20 per share and the investor receives a $1 dividend per year the dividend yield is 5% ($1/$20).

$k = 5\% + g$

If there was no growth then we could say that k = 5%.

$k = 5\% + 0\%$

When a company generates earnings, it chooses how much to pay out to stockholders and how much to re-invest in the company. In the above example the retention rate is zero and 100% of the earnings are paid out as a dividend. Companies usually do not pay 100% of earnings as a dividend. The percentage of earnings not paid out as a dividend benefits investors because this portion is re-invested in the company. Whatever percentage of earnings that are re-invested in the company is called the retention rate. For example, if half the earnings are re-invested the retention rate is 50%. The retained earnings are re-invested in the company because management presumably believes there are good investments they can make with that money. The investors' expectation of the returns on this re-invested money is the Return on Book Equity (ROE), not the cost of equity r.

As stated earlier, growth is equal to ROE X Retention Rate. For example if investors expect an ROE of 8% and a 50% retention rate the growth is equal to 4% (50% X 8%).

Q. **IS IT ALWAYS APPROPRIATE TO USE THE SIMPLIFIED VERSION OF THE DCF METHOD?**

A. No. In order to use the simplified version, our best estimate must be that the following factors will grow at the same rate:

Earnings

Book Value

Dividends

Stock Price

If these are all expected to grow at the same rate, then growth (g) will be equal to ROE X retention rate.

Q. **CAN YOU PROVIDE AN EXAMPLE WHERE IT IS NOT APPROPRIATE TO USE THE SIMPLIFIED VERSION OF THE DCF METHOD?**

A. Yes. If our best estimate is that earnings per share and stock price will grow at 6% per year while dividends per share will grow at 3% per year and book value per share will grow at 4% per year then the simplified version of the DCF method should not be used.

As shown in Exhibit JAR-10, Table 1, the dividend yield decreases from 5.30% in 2007 to 4.73% in 2011. In this case it is not proper to use either the 5.30% or the 4.73% in the simplified formula. Taking an average over any given time period is also improper because the dividend yield keeps decreasing in the future. In Table 1, return on book equity increases from 10.19% in 2007 to 11.00% by 2011. It is unrealistic to expect any company, let alone a regulated public utility, to have a return on book equity that increases indefinitely.

Q. **PLEASE PROVIDE AN EXAMPLE OF A CONDITION WHERE IT IS APPROPRIATE TO USE THE SIMPLIFIED VERSION OF THE DCF METHOD.**

A. In the Table 2 of Exhibit JAR-10, the growth rate is equal to 4% for earnings per share, book value per share, stock price and dividend per share. The 4% is calculated by multiplying ROE X Retention Rate. The starting point of the table shows earnings per share at $1, book value per share is $10, stock price is $11 and dividends per share is $0.60. The retention rate r is equal to 40%. It was calculated by taking $1 (earnings per share) minus $0.60 (dividends per share) and then dividing by $1 earnings per share. The ROE is equal to 10%, $1 (earnings per share) divided by $10 (book value per share). So, ROE X Retention Rate is equal to 4% (40% retention rate X 10% ROE).

The Table 2 shows that if earnings per share, book value per share, stock price and dividends per share all grow at 4% then book value per share grown at 4% is equal to earnings per share minus dividends per share plus the last year's book value for every year.

All of the components must grow at a rate equal to ROE X Retention Rate. If any of these components grow at a different rates, or anything other than ROE X Retention Rate then problems such as permanently increasing or decreasing dividend yield can occur, creating problems that ensure an inaccurate answer from the DCF model.

Q. **IS IT ALWAYS NECESSARY TO REJECT THE CONSTANT GROWTH FORM OF THE DCF METHOD FOR A COMPANY WITH ANY FORECASTED NON-CONSTANT GROWTH FACTORS?**

A. No. It can be possible to still arrive at a reasonable estimate for the cost of equity using the constant growth form of the DCF model so long as the inputs are treated in a manner consistent with constant growth. For example, if the dividend rate used to compute the dividend yield is used to determine the retention rate, then the computation is the same as if dividends were to grow at the same rate as earnings, dividends and book value.

Q. **IS THE APPROACH YOU HAVE DESCRIBED TO MAKE THE INPUTS INTO THE CONSTANT GROWTH DCF AN ABSOLUTELY PERFECT SOLUTION?**

A. No. However, it is the most accurate way to fit a non-constant growth situation into a constant growth DCF formula. It is considerably more accurate than haphazard approaches such as adding a five-year earnings per share growth rate to the current dividend yield. Being true to the mathematical demands of the constant growth DCF model is an essential step to using it properly and therefore maximizing its accuracy.

Note the self-correcting nature of the approach to the constant growth DCF that I have described:

A) Suppose a company is expected to grow dividends less rapidly than earnings simply because management plans to invest a larger portion of earnings in the future. This change would lower the expected dividend yield and raise future growth. The least accurate way to handle this situation would be to use the higher expected growth without making a corresponding reduction to the dividend yield. The approach I have used does not make that mistake, while a simplistic approach of merely adding a five-year earnings per share growth rate to an historical dividend yield does make that mistake.

B) Suppose a company is expected to undergo a temporary rapid increase because the base period has a lower than sustainable earned return on book equity. By equating the retention rate based not only on the actual dividend but on the earnings rate that would have existed if the future expected earned return on equity had been earned, the higher and more sustainable growth rate is computed. However, unsustainable transitional growth derived from a time when return on equity is changing substantially, i.e. earnings on book is non-constant. The approach I have used remains correct, while a simplistic approach of merely adding a five-year earnings per share growth rate to an historical dividend yield would be invalid.

Q. **DOES THE CONSTANT FORM OF THE DCF MODEL ASSUME THAT THE STOCK PRICE WILL BE EQUAL TO BOOK VALUE?**

A. No. Stock price and book value are modeled to grow at the same rate. If book value and stock price grow at the same rate, the market-to-book ratio must be expected in the DCF model to remain constant rather than gravitate to some higher or lower value in the future.

Q. **IS THE ACCURACY OF THE ANSWER OBTAINED FROM THE DCF MODEL INFLUENCED BY THE MARKET –TO-BOOK RATIO PREVAILING AT THE TIME OF THE ANALYSIS?**

A. No. The accuracy of the DCF result is driven by the accuracy of future cash flow estimates. There is no reason to believe the accuracy of a future cash flow projection is inherently more or less difficult to make for a company with a market-to-book ratio of 0.80, 1.0 or 2.0.

Q. **IF THE COST OF EQUITY COMPUTED BY THE DCF MODEL IS DIFFERENT THAN THE RETURN ON EQUITY USED TO COMPUTE GROWTH, DOES THIS CAUSE ANY PROBLEMS?**

A. No. The cost of equity is the return investors expect to receive on their investment at market price, while the return on equity used to compute growth is equal to the return investors expect a company will be able to earn on its book value at the time the DCF computation was being made. Since market-to-book ratios are rarely exactly equal to 1.0, the return on market price expected by investors is rarely equal to the return on equity investors expect will be achieved on book value.

Q. **COULD A COMMISSION'S COST OF EQUITY DECISION CHANGE INVESTOR'S EXPECTATION FOR THE FUTURE RETURN ON BOOK VALUE?**

A. Yes. However, it is highly unlikely that any one commission's decision could have a material impact on the future expected return on equity for a comparative group of utility companies. Nevertheless, if a commission's decision were to change investors' expectation of future return on book equity, it could cause numerous inputs in the DCF model to change. The stock price would change in response to a higher or lower dividend rate and an increased or decreased expected growth could cause investors to change their future expected return on book equity.

Q. HOW DID YOU CALCULATE THE DIVIDEND YIELD, D/P?

A. I obtained the most recent quarterly dividend for each of the gas companies. For each company, I estimated the annual dividend payments by multiplying the most recent quarterly dividend by 4.

From Yahoo Finance I obtained the monthly closing prices for all of the comparative gas companies. For every company, I divided the annual dividend payments by their closing stock price for the year ending 5/31/08 to get the dividend yield per company. The dividend yields for these gas companies based on the year-end stock price averaged 3.60% (See Exhibit JAR-9, page 1).

I also calculated the average dividend yield for the year for the gas company group by dividing the same dividend payment by the average of the high and low monthly closing stock prices of the past 12 months to get dividend yields. The average dividend yield computed on this basis was 3.70% (See Exhibit JAR-9, page 1)

Q. **HOW DID YOU CALCULATE THE GROWTH (g) PORTION OF YOUR DCF ANALYSIS?**

A. For each company I calculated the growth component by solving for the Future Expected Return on Book Equity multiplied by the Retention Rate. I then added an allowance for growth caused by the sale of new common stock above book value.

Q. **HOW DID YOU ESTIMATE THE FUTURE RETURN ON BOOK EQUITY EXPECTED BY INVESTORS?**

A. I estimated the future expected return on book equity by reviewing the return on book equity published by Value Line, and considering that forecast in the context of historic actual returns on equity.

Q. **HOW DID YOU DETERMINE THE RETENTION RATE?**

A. I calculated the dividend yield on book by multiplying the dividend yield on market price by the market to book ratio. I multiplied this dividend yield on book

number by the future expected return on book equity to get the retention rate. (See Exhibit JAR-2)

Q. HOW DID YOU DETERMINE THE SALE OF NEW COMMON STOCK?

A. I used the most current issue of Value Line to obtain the amount of stock outstanding in 2007 and the number of shares forecasted to be outstanding in 2011-2013. I calculated the compound annual growth rate between 2007 and the 2011-2013 timeframe for the comparative gas group. (See Exhibit JAR-11)

Q. PLEASE SUMMARIZE YOUR DCF RESULTS?

A. The results of my DCF analysis can be seen on Exhibit JAR-2. The average dividend yield for the comparative gas companies is 3.60% to 3.70%. The average growth rate of these companies is between 5.62% and 5.73%. To account for dividend growth for next year, 0.10 is added. The DCF method is indicating a cost of equity of between 9.42% and 9.43%. (See Exhibit JAR-2)

VII. CAPTAL ASSET PRICING MODEL (CAPM)

Q. WHAT IS THE CAPITAL ASSET PRICING MODEL (CAPM)?

A. The capital asset pricing model is a method for calculating the cost of equity for a stock by adding a risk premium to a risk free rate. The risk premium appropriate for a group of companies is proportional to the "beta" of that group.

COE = Rf + B x (Rm – Rf)

COE = Cost of equity

Rf = Risk free rate

B = Beta

Rm = the expected return on the market

Q. **WHAT IS A RISK FREE RATE?**

A. The risk free rate is theoretically a rate that investors receive for investing in a security that has no chance of unexpected price fluctuations. Short-term U.S. government treasury bills are often used to estimate this risk free rate because their default risk is close to zero and because the time to maturity is so short that unexpected price fluctuations from changes in the interest rates are minimal.

Q. **CAN THE RATE OF A LONGER TERM BOND YIELD, LIKE A 20-YEAR TREASURY BILL, ALSO BE USED AS A RISK FREE RATE?**

A. While a longer-term Treasury bond could be used in a risk premium analysis, a 20-year Treasury bond is not truly risk free because it is subject to interest rate risk. For example, an investor buys a 20-year U.S. Treasury bond that is yielding 5% and then interest rates rise to 6% the price of a 20-year Treasury bond will decrease, substantially. Therefore, if a 20-year Treasury bond is used in a CAPM analysis, it should be used in a way that recognizes the non-risk-free nature of this 20-year U.S. Treasury bond.

Q. **WHAT IS A RISK PREMIUM?**

A. The risk premium is the return that investors demand to take on additional risk. The risk premium can be the difference between any financial instrument in different risk categories such as the difference between U.S. Treasury bonds, corporate bonds, preferred stock or common stock.

Q. **WHY DO INVESTORS DEMAND A RISK PREMIUM TO INVEST IN STOCKS?**

A. Investors prefer avoiding uncertainty. They will seek investments with uncertainty if an opportunity is perceived to receive adequate compensation for taking on the additional risk.

Q. **FOR WHAT TYPE OF RISK DO INVESTORS DEMAND COMPENSATION?**

A. The only type of risk that investors demand compensation for is the risk that cannot be eliminated through diversification. Investors buy stocks as part of a diversified portfolio. The portfolio effect causes the diversifiable risks of each company to cancel out – unexpected problems are offset by unexpected success. After all of the diversifiable risks of all the companies in an investor's portfolio cancel out, then only non-diversifiable risk remains. Even a well-diversified portfolio can be harmed by a worldwide recession or a sudden shortage of oil.

Q. **WHAT IS BETA?**

A. Beta, as explain on page 19 earlier in my testimony, is a measurement of the correlation between a given stock and the market as a whole.

Q. **DO ALL COMPANIES REQUIRE THE SAME RISK PREMIUM?**

A. No. There are companies that are more sensitive than others to non-diversifiable risks such as changes in the economy. A portfolio more heavily weighted with companies that are especially impacted by the market will generally require a higher risk premium than a low risk portfolio. For example, a portfolio heavily weighted with stocks that sell luxury items may be harmed dramatically if disposable income goes down because such products are the first to go in hard times. Conversely, a portfolio heavily investing in companies that make staple products like utilities, corn flakes or soap is likely to be less susceptible to changes in the economy, have more stable stock prices and therefore require a lower risk premium.

Q. **HOW DID YOU APPLY THE CAPM?**

A. I compared the actual compounded annual returns earned by each of 10 groups of companies from 1926-2007 with an average beta of each group. In this way, I effectively examined the returns on ten different portfolios, each with a different average beta. Graph 1 shown in Exhibit JAR-7 page 1 shows that on average from 1926-2007, companies with a beta of 1.0 earned a compounded annual return of 10.40% for its equity investors. The average beta for the comparative gas companies chosen by the used by Staff in Docket No. 080006-WS is 0.88,

indicating that the non-diversifiable risk for these gas companies is 88% of the average risk. The least squared equation indicates that the earned return to stockholders who invested in a portfolio with a beta of 0.88 earned a compounded annual return of 9.72% from 1926-2007.

The 10.40% compounded annual average historical actual return earned by companies with a beta of 1.0 and a 9.72% historical actual return earned by companies with 0.88 occurred over a time when the compound annual rate of inflation averaged 3.0%. However, the current inflation expectation demanded by investors is 2.65% or 0.35% lower than the inflation rate embedded in the historical actual return numbers. See Exhibit JAR-3, page 1. Therefore, to make the historical returns consistent with investors' current inflation expectations, the 9.72% should be reduced by 0.35%. This 9.72% return adjusted for the current inflation expectation results in a 9.37% CAPM indicated cost of equity for electric companies with a beta of 0.88.

Q. **ARE COMPOUNDED ANNUAL RETURNS THE SAME AS THE GEOMETRIC MEAN?**

A. Yes.

Q. **IS THE COMPOUND ANNUAL AVERAGE RETURN, OR GEOMETIC MEAN, A BETTER MEASURE OF ACTUAL HISTORICAL RETURNS**

AND WHAT INVESTORS EXPECT TO EARN IN THE FUTURE THAN THE ARITHMETIC MEAN?

A. Yes. Page 24 of Stocks for the Long Run, Third Edition contains the following:

> Investors can be expected to realize geometric returns only over long periods of time. The average geometric return is always less than the average arithmetic return except when all yearly returns are exactly equal. The difference is related to the volatility of yearly returns.
>
> A simple example demonstrates the difference. If a portfolio falls by 50 percent in the first year and then doubles (up 100 percent) in the second year, "buy and hold" investors are back to where they started, with a total return of zero. The compound or geometric return (rG), defined earlier as (1-.5)(1+1)-1, accurately indicates the zero total return of this investment over two years.
>
> The average annual arithmetic return (rA) is +25percent =(-50 percent + 100 percent)/2. Over 2 years, this average return can be turned into a compound or total return only by successfully "timing" the market, specifically increasing the funds invested in the second year and hoping for a recovery in stock prices. Had the market dropped again in the second year, the strategy would have

been unsuccessful and would have resulted in lower total returns than achieved by the buy-and-hold investor.

Q. **WHAT GROUP OF COMPANIES DID YOU USE IN YOUR CAPM ANALYSIS?**

A. I relied on the Ibbotson Associates data from their 2008 Yearbook that includes 3,901 companies.

Q. **HOW DID YOU DIVIDE THESE COMPANIES INTO TEN PORTFOLIOS?**

A. The only data available in the Ibbotson Associates report with the companies it covers divided into separate portfolios are these ten groups that were divided by size. Since these ten groups all had significantly different betas and because the actual historical earned returns for these groups was also quantified, it was possible to use these groups to show how beta related to the actual earned return earned by each of these groups. It was acceptable to use the portfolios consisting of different size companies in this analysis because:

1) By CAPM theory, size is a diversifiable risk and therefore does not impact the cost of equity.

2) The results themselves confirm that size does not matter because the least squares trend line projects to a credible risk-free rate. If size, in addition to beta, did actually influence the cost of equity, then the projection of the

data would be substantially different than the cost rate expected for a zero risk security (i.e., a security with a beta of zero.)

Q. **WHAT DID YOU USE FOR A RISK FREE RATE?**

A. The most accurate risk free rate to use with this analysis is the one that is defined by the data itself. That way, the true historical actual relationship between beta and the cost of equity is maintained.

Q. **WHAT IS THE RELATIOSHIP BETWEEN THE COMPOUNDED ANNUAL EARNED RETURN AND BETA FOR THE GROUP OF COMPANIES YOU SELECTED?**

A. The data points in Graph 2 in Exhibit JAR 7, page 2, are numbered from highest to lowest beta, with number 1 being the group with the lowest beta and number 10 being the group with the highest beta. A least-squared line was used to fit a line to the data points and the derived equation was used to calculate the returns for a given beta. Historically a company with a beta of 1 has earned a return of about 10.40%. A company with a beta equal to 0.88, the average beta of the comparative gas companies, has earned approximately 9.72%.

Q. **DOES GRAPH 2 IN EXHIBIT JAR-7 SHOWING THE RELATIONSHIP BETWEEN BETA AND RETURNS HELP CONFIRM THE CAPM THEORY?**

A. Yes. The equation of the least squares line is Y = .059922 X + 0.0445 so the line indicates a y-intercept (or security with a zero beta) of 4.45%. Theoretically a firm with a zero beta is a risk free security. The compound annual return actually achieved by investors in U.S. Treasury Bills from 1926-2007 was 4.70%, or only 25 basis points higher than the result consistent with the actual return versus actual beta data used in my CAPM analysis. This small difference is an excellent confirmation of the integrity of the CAPM theory.

Q. **DO THESE HISTORICAL ACTUAL RETURNS FROM 1926-2007 AUTOMATICALLY EQUATE TO THE COST OF EQUITY?**

A. No. The cost of equity at any given risk level is directly influenced by investors' expectations of future inflation rates, while the historical data is a product of the inflation rates that existed in the past. The compounded annual rate of inflation between 1926 and 2007, the time period from which that data used to construct this graph was compiled, inflation averaged 3.0%. Currently however the bond market shows that investor's inflation expectation is 2.65%. Since the returns demanded by investors include an allowance for inflation, it is appropriate to update the historical actual returns to be consistent with what investors currently demand for inflation. Since inflation expectation is 0.35% lower than it was from 1926-2007, the cost of equity is appropriately estimated to be 0.35% lower at all risk levels than it was on average from 1926 to 2007. The current cost of equity for the gas group with a beta of 0.88 is 9.37%. See Exhibit JAR 3, page 2.

Q. HOW DID YOU CALCULATE WHAT THE MARKET EXPECTS INFLATION TO BE AS OF MAY 29, 2008?

A. I took the difference between 20-year US treasury bonds and the long-term inflation indexed treasury bonds. The yield on the 30-year US Treasury bonds is 4.70%[7] and the yield on the inflation-indexed bonds is 2.05%[8]. Since the market is willing to accept a 2.05% yield instead of a 4.70% yield in return for protection against inflation, the market expects inflation to be 2.65% (4.70% - 2.05%).

Q. DOES THEORY AND EMPIRICAL DATA SUPPORT YOUR FINDINGS?

A. Yes. The term Security Market Line (SML) is given to the expected return-beta relationship. In the financial textbook *Investments* (McGraw-Hill/Irwin 2005), by Bodie, Kane and Marcus, it states on page 290 that "...fairly priced' assets plot exactly on the SML..." and, "...all securities must lie on the SML in market equilibrium" thus the theory predicts that linear relationships was confirmed with the actual return data from 1926-2007.

The CAPM theory says the relationship between the cost of capital and beta is linear. If the historical actual earned return data I used is consistent with what investors' expected and if the CAPM theory is correct, it is possible to estimate the risk-free rate that existed on average over the 1926-2007 period by making a linear projection of the historical stock returns. As shown on my Graph 1 (Exhibit JAR-7, page 1), the stock based empirical data results in a computed

[7] www.bloomberg.com/markets/rates/index.html, 5/29/08
[8] www.bloomberg.com/markets/rates/index.html, 5/29/08

risk-free rate of 4.45%. This is very close to the actual 4.6% compounded annual return of U.S. Treasury Bills.

Q. **IS THE U.S. TREASURY BILL YIELD A GOOD ESTIMATE OF THE RISK FREE RATE?**

A. On average for the long-term, it is. However spot distortions are common. The current rate on the 60-day U.S. Treasury is 2.03%[9] is lower than the long-run average because the U.S. Federal Reserve Chairman, Ben Bernanke, has been reducing interest rates in an attempt to stimulate the economy.

Q. **HOW DOES YOUR CAPM RESULT COMPARE TO THE RESULTS STATED IN IBBOTSON ASSOCIATES?**

A. On page 179 of "Stocks, Bonds, Bills and Inflation" Ibbotson SBBI/Morningstar 2008 yearbook, the authors conclude:

> The supply side model estimates that stocks will continue to provide significant returns over the long run, averaging around 9.66% per year, assuming historical inflation rates. The equity risk premium, based on the supply side earnings model, is calculated to be 4.24% on a geometric basis and 6.23% on an arithmetic basis.

[9] www.bloomberg.com/markets/rates/index.html, 5/29/08

In the above statement, the 9.66% return expected by Ibbotson SBBI/Morningstar is based on a stock of average risk. Based on historical inflation rates, the expected return I calculate for a company of average risk at 10.4% is higher than the 9.66% concluded by Ibbotson SBBI/Morningstar. Considering that inflation expectations are lower than the historical average and the group of 7 gas companies has a lower risk than the company of average risk, my finding of a 9.37% CAPM cost of equity is conservatively high.

Q. **IS THERE ANOTHER IMPORTANT VERIFICATION OF THE CAPM CONCLUSION YOU HAVE RECOMMENDED?**

A. Yes. Page 12 of Stocks for the Long Run by Wharton Professor, Jeremy Siegel, concludes that "... the real after-inflation, compound annual rate of return on stocks...real return on stocks... averaged 6.9 percent per year since 1926." The book also points out that this real after-inflation return on stocks has been "...extraordinarily stable..., averaging 6.6 percent from 1871 through 1925..." The book also mentions that the return since World War II was 7.1 percent.

Recognizing that the return data prior to 1926 contains many fewer companies and is in a much less mature economy than the data since 1926, I will concentrate on the inflation premium data after 1926 and will therefore conclude that the equity premium in excess of inflation for the average common stock in the U.S. is 7.1%. Adding the current inflation expectation derived from the bond market of 2.65% results in a cost of equity estimate of 9.67% for a company of average risk.

This result is virtually identical to the 9.66% estimate made by Ibbotson Associates, further confirming that my 10.4% CAPM estimate based on the results for the average stock is conservatively high.

Q. **DOES THIS CONCLUDE YOU TESTIMONY?**

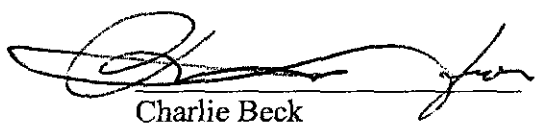
A. Yes.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a copy of the foregoing Direct Testimony of James A. Rothschild has been furnished by U.S. Mail to the following parties on this 1st day of August, 2008, to the following:

Jean Hartman
General Counsel's Office
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

Martin S. Friedman, Esquire
Rose, Sundstrom & Bentley, LLP
2180 W. State Road 434, Suite 2118
Longwood, FL 32779



Charlie Beck

RESUME OF JAMES A. ROTHSCHILD

UTILITY REGULATION EXPERIENCE

- Filed expert testimony on rate of return, accounting and/or financial issues with regard to electric, telephone, gas, water, health care and insurance rate setting matters in the following jurisdictions:

Alabama	Kentucky	Oklahoma
Arizona	Maryland	Oregon
Connecticut	Maine	Pennsylvania
Delaware	Massachusetts	Rhode Island
FERC	Minnesota	South Carolina
Florida	New Jersey	Vermont
Georgia	New York	Washington, DC
Illinois	Nova Scotia	Washington

OTHER BUSINESS EXPERIENCE

- Economic Analyst - Evaluated profitability of expansion and new venture proposals and provided financial support material for contract negotiations.

- Process Engineer - Responsible for process design and invented process improvements, which included a device that reduced a major water pollution problem.

EMPLOYMENT HISTORY

February 1985-Present	Rothschild Financial Consulting
May 1979-January 1985	Georgetown Consulting Group, Inc.
August 1976-May 1979	J. Rothschild Associates
May 1972-August 1976	Touche Ross & Company
June 1967-May 1972	Olin Corporation

EDUCATION

- Case Western Reserve University, MBA, Banking& Finance, 1971
- University of Pittsburgh, BS, Chemical Engineering, 1967

GAS COMPANIES
CAPITAL ASSET PRICING MODEL
BASED ON HISTORICAL ACTUAL COMPOUND ANNUAL RETURNS

1	Historical Actual Return - beta = 1	10.40%	[A]
2	Historical Actual Return - beta = 0.88	9.72%	[B]
3	Interest Rate on 30-Year Treasury Bonds	4.70%	[C]
4	Interest Rate on Long-Term Inflation Indexed Treasury Bonds	2.05%	[C]
5	*Current Market Inflation Expectation*	2.65%	Line 1 minus Line 2
6	Historical Actual Inflation	3.00%	[D]
7	*Difference From Historical Actual Inflation*	0.35%	
8	Adjusted Returns For Current Market Inflation Expectation Beta = 1	10.05%	

CAPITAL ASSET PRICING MODEL

9	Indicated Cost of Equity for Portfolio of Companies with a beta of 0.89	9.37%

Sources:
[A] Ibbotson Associates 2008 Yearbook, page 295
[B] Docket No. 080006-WS
[C] www.bloomberg.com/markets/rates/index.html, 5/29/08
[D] Ibbotson Associates 2008 Yearbook, page 331

GAS COMPANIES

CAPITAL ASSET PRICING MODEL

HISTORIC ACTUAL COMPOUND RETURNS
and HISTORIC ACTUAL COMPOUND ANNUAL RETURNS ADJUSTED FOR
DIFFERENCE BETWEEN CURRENT AND HISTORICAL ACTUAL INFLATION RATE

		1	2	3	4	5	6	7	8	9	10
[A]	Portfolio by Size Decile										
[A]	Beta	0.91	1.03	1.10	1.12	1.16	1.18	1.24	1.30	1.35	1.41
[B]	Historic Actual Compounded Annual Return	9.60%	10.90%	11.30%	11.10%	11.70%	11.70%	11.60%	11.80%	11.90%	13.60%
[C]	Reduced Compounded Annual Returns	9.25%	10.55%	10.95%	10.75%	11.35%	11.35%	11.25%	11.45%	11.55%	13.25%

[D] **Least Squared Line derived from compounded annual returns per decile**

Beta	Slope	Y-Intercept	**Return**
0.88	5.9922	4.45	**9.72%**

See graph on Exhibit JAR- 6, page 4

Least Squared Line

	Beta	Slope	Y-Intercept	**Return**
[E]	0.88	5.9922	4.1	**9.37%**

See graph on Exhibit JAR- 6, page 5

[A] Ibbotson Associates 2008 Yearbook, page 142
[B] Ibbotson Associates 2008 Yearbook, page 130
[C] by 0.35% actual difference between 3.00% historical and 2.65% current expected long-term inflation rate.
[D] Least Squared Line derived from Historical Actual Compounded Annual Return
[E] Least Squared Line derived from Reduced Compouned Annual Return

Water & Wastewater Leverage Formula
Docket 080006-WS
YEAR 2008
Computation of Overall Cost of Capital (OCC)
Including Impact of Income Taxes

	Source	
Natural Gas Utilities Index DCF Model	Exhibit No. ___(JAR-2)	9.43%
CAPM*	Exhibit No. ___(JAR-3)	9.37%
AVERAGE		9.40%
Bond Yield Differential		0.00%
Private Placement Premium		0.00%
Small Utility Risk Premium		0.00%
Adjustment to Reflect Required Equity Return at a 40% Equity Ratio		1.13%
Cost of Equity for Average Florida WAW Utility at a 40% Equity Ratio		10.53%
Small Utility Risk Premium		0.00%
Private Placement Premium		0.00%
A bond yield		6.08%
Baa Rate		6.08%

CAPITAL COMPONENT			WEIGHT	
CE	49.12%	9.40%	7.52%	[1]
TOTAL DEBT	50.88%	6.08%	3.09%	
	100.00%		10.610636%	

CE	40.00%	10.5290%	6.86%	Solved for return on equity to keep overall cost of capital constant
TOTAL DEBT	60.00%	6.26%	3.76%	
	100.00%		10.61527%	

Adds to debt cost per Recommended Leverage Formula

[1] Weighted cost of equity is cost of equity x percent common equity divided by 1- effective tax rate.

Tax gross-up is based upon the corporate federal tax rate of 35% , and the Florida state corporate income tax rate of 5.5%.

Income	1.000
State tax	0.055
Federal taxable	0.945
Federal income tax	0.331
After tax income	0.614
Effective tax rate	0.38575

ESTIMATED CHANGE IN COST OF DEBT AS CAPITAL STRUCTURE CHANGES

	A. Equity ratio		B. Debt Cost	
Cost of debt at	49.12%	[1]	6.08%	[2]
Cost of debt at	40.00%		6.26%	[3]
DIFFERENCE	9.12%		0.18%	
			0.0197	[Line 3B/Line 3A]

EXAMPLE OF COST OF DEBT RESULTS:

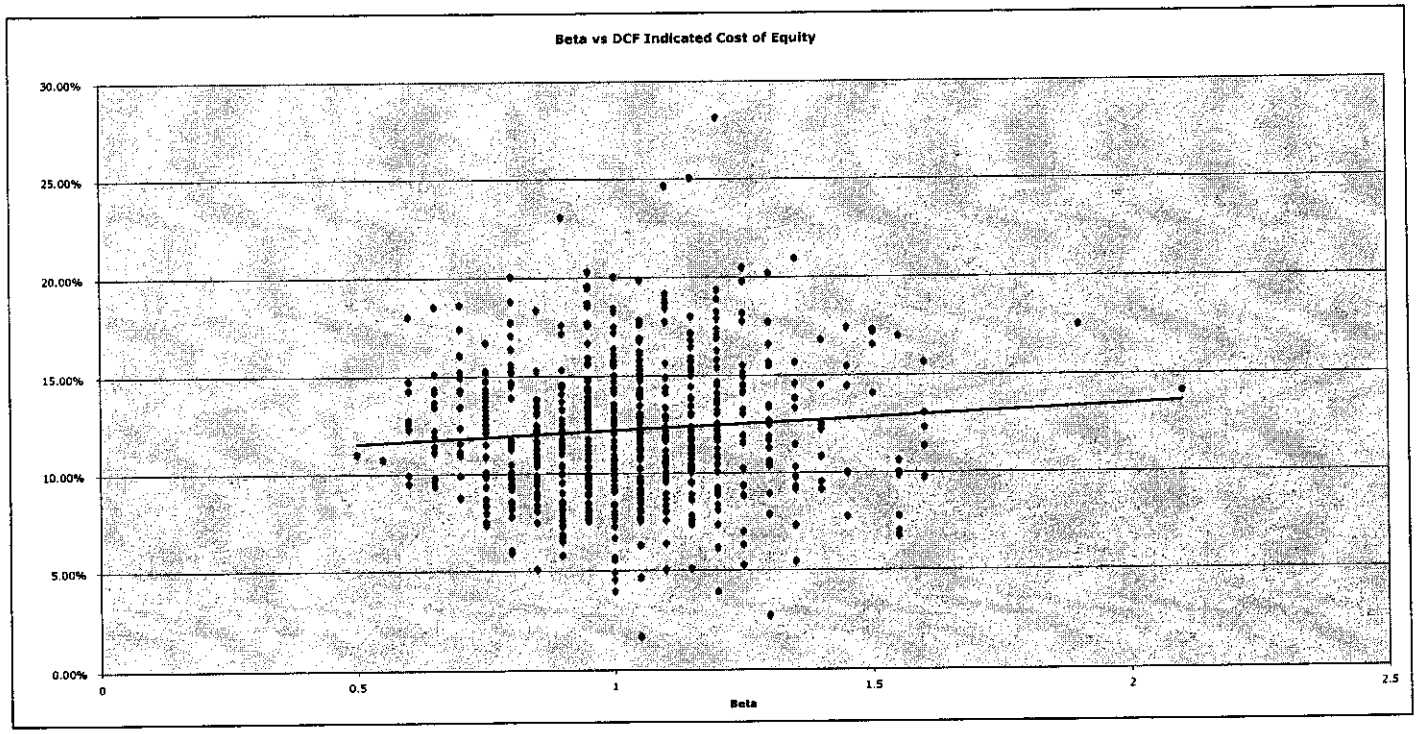
Equity Ratio	Debt Ratio	Cost of Debt
49.12%	50.88%	6.08%
40.00%	60.00%	6.26%
42.50%	57.50%	6.21%
45.00%	55.00%	6.16%
47.50%	52.50%	6.11%
50.00%	50.00%	6.06%
52.50%	47.50%	6.01%
55.00%	45.00%	5.96%
100.00%	0.00%	5.08%

Source:

[1] 0
1-percentage of debt
[2] Bond-yield schedule from Staff report
A2 rate as of March 2008
[3] Bond-yield schedule from Staff report
Baa2 rate as of March 2008
Baa2 rating estmated for 40% common equity ratio per
Exhibit JAR- 7, Page 3

Graphed of Beta for Companies Used in Staff's Analysis
Showing Correlation Between Risk and Return
For the DCF calculation Included in Staff's CAPM method

Docket No. 080006-WS
Exhibit No. ___(JAR-5)
Beta vs DCF Cost of Equity
Page 1 of 1



Modigliani-Miller Theorem
From Wikipedia

The *Modigliani-Miller theorem* (of Franco Modigliani, Merton Miller) forms the basis for modern thinking on capital structure. The basic theorem states that, in the absence of taxes, bankruptcy costs, and asymmetric information, and in an efficient market, the value of a firm is unaffected by how that firm is financed.[1] It does not matter if the firm's capital is raised by issuing stock or selling debt. It does not matter what the firm's dividend policy is. Therefore, the Modigliani-Miller theorem is also often called the capital structure irrelevance principle.

Modigliani was awarded the 1985 Nobel Prize in Economics for this and other contributions.

Miller was awarded the 1990 Nobel Prize in Economics, along with Harry Markowitz and William Sharpe, for their "work in the theory of financial economics," with Miller specifically cited for "fundamental contributions to the theory of corporate finance."
Contents
[hide]

Historical background

Miller and Modigliani derived the theorem and wrote their pathbreaking article when they were both professors at the Graduate School of Industrial Administration (GSIA) of Carnegie Mellon University. In contrast to most other business schools, GSIA put an emphasis on an academic approach to business questions. The story goes that Miller and Modigliani were set to teach corporate finance for business students despite the fact that they had no prior experience in corporate finance. When they read the material that existed they found it inconsistent so they sat down together to try to figure it out. The result of this was the article in the American Economic Review and what has later been known as the M&M theorem.

Propositions

The theorem was originally proven under the assumption of no taxes. It is made up of two propositions which can also be extended to a situation with taxes.

Consider two firms which are identical except for their financial structures. The first (Firm U) is unlevered: that is, it is financed by equity only. The other (Firm L) is levered: it is financed partly by equity, and partly by debt. The Modigliani-Miller theorem states that the value of the two firms is the same.

Without taxes

Proposition I: V_U = V_L \, where VU is the value of an unlevered firm = price of buying a firm composed only of equity, and VL is the value of a levered firm = price of buying a firm that is composed of some mix of debt and equity.

To see why this should be true, suppose an investor is considering buying one of the two firms U or L. Instead of purchasing the shares of the levered firm L, he could purchase the shares of firm U and borrow the same amount of money B that firm L does. The eventual returns to either of these investments would be the same. Therefore the price of L must be the same as the price of U minus the money borrowed B, which is the value of L's debt.

This discussion also clarifies the role of some of the theorem's assumptions. We have implicitly assumed that the investor's cost of borrowing money is the same as that of the firm, which need not be true in the presence of asymmetric information or in the absence of efficient markets.

Proposition II:
Proposition II with risky debt. As leverage (D/E) increases, the WACC stays constant.
Proposition II with risky debt. As leverage (D/E) increases, the WACC stays constant.

k_e =k_0+ \frac{D}{E}\left({k_0 - k_d } \right)

* ke is the required rate of return on equity, or cost of equity.
* k0 is the cost of capital for an all equity firm.
* kd is the required rate of return on borrowings, or cost of debt.
* D / E is the debt-to-equity ratio.

This proposition states that the cost of equity is a linear function of the firm's debt to equity ratio. A higher debt-to-equity ratio leads to a higher required return on equity, because of the higher risk involved for equity-holders in a company with debt. The formula is derived from the theory of weighted average cost of capital.

These propositions are true assuming the following assumptions:

* no taxes exist,
* no transaction costs exist, and
* individuals and corporations borrow at the same rates.

These results might seem irrelevant (after all, none of the conditions are met in the real world), but the theorem is still taught and studied because it tells us something very important. That is, capital structure matters precisely because one or more of these assumptions are violated. It tells us where to look for determinants of optimal capital structure and how those factors might affect optimal capital structure.

[edit] With taxes

Proposition I:

$$V_L = V_U + T_C D\,$$

where

* VL is the value of a levered firm.
* VU is the value of an unlevered firm.
* TCD is the tax rate (TC) x the value of debt (D)

This means that there are advantages for firms to be levered, since corporations can deduct interest payments. Therefore leverage lowers tax payments. Dividend payments are non-deductible.

Proposition II:

$$r_E = r_0 + \frac{D}{E}(r_0 - r_D)(1-T_C)$$

where

* rE is the required rate of return on equity, or cost of equity.
* r0 is the cost of capital for an all equity firm.
* rD is the required rate of return on borrowings, or cost of debt.
* D / E is the debt-to-equity ratio.
* Tc is the tax rate.

The same relationship as earlier described stating that the cost of equity rises with leverage, because the risk to equity rises, still holds. The formula however has implications for the difference with the WACC. Their second attempt on capital structure included taxes and identified that as the level of gearing increases by replacing equity with cheap debt the level of the WACC drops and an optimal capital structure does indeed exist at a point where debt is 100%

The following assumptions are made in the propositions with taxes:

* corporations are taxed at the rate TC on earnings after interest,

* no transaction costs exist, and
* individuals and corporations borrow at the same rate

Miller and Modigliani published a number of follow-up papers discussing some of these issues.

The theorem was first proposed by F. Modigliani and M. Miller in 1958.

[edit] See also

* Arbitrage pricing theory
* Capital structure
* Cost of capital
* Debt to equity ratio
* Fisher separation theorem
* John Burr Williams
* Hamada's Equation
* Pecking order theory
* Weighted average cost of capital
* Tobin's Q

[edit] Economic consequences

The Modigliani-Miller theorem, which justifies near limitless financial leverage, has largely boosted economic and financial activities.[citation needed] But it also brought increased complexity, lack of transparency, higher risk and uncertainty in those activities.[citation needed]

[edit] Footnotes

1. ^ MIT Sloan Lecture Notes, Finance Theory II, Dirk Jenter, 2003

[edit] References

* Brealey, Richard A.; Myers, Stewart C. [1981] (2008). Principles of Corporate Finance, 9th edition, Boston: McGraw-Hill/Irwin. ISBN 9780073405100.
* Stewart, G. Bennett (1991). The Quest for Value: The EVA management guide. New York: HarperBusiness. ISBN 0887304184.
* Modigliani, F.; Miller, M. (1958). "The Cost of Capital, Corporation Finance and the Theory of Investment". American Economic Review 48 (3): 261–297.
* Miller, M.; Modigliani, F. (1963). "Corporate income taxes and the cost of capital: a correction". American Economic Review 53 (3): 433–443.
* Miles, J.; Ezzell, J. (1980). "The weighted average cost of capital, perfect capital markets and project life: a clarification". Journal of Financial and Quantitative Analysis 15: 719–730.

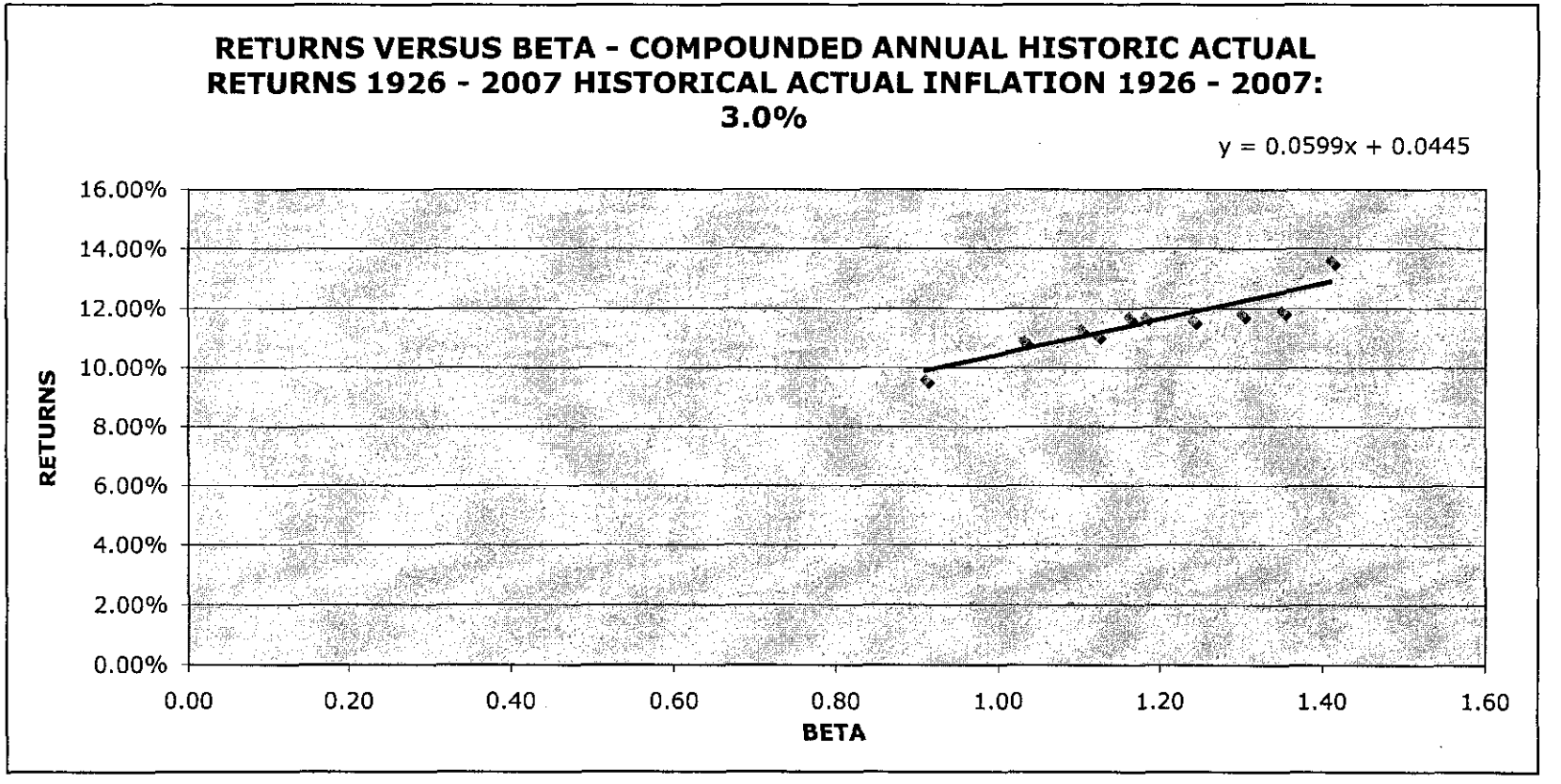
[edit] Links

* MIT Sloan Lecture Notes, Finance Theory II, Dirk Jenter, 2003
* Corporate Finance: The Modigliani-Miller Theorems
* Ruben D Cohen "An Implication of the Modigliani-Miller Capital Structuring Theorems on the Relation between Equity and Debt"

Average Betas of 10 Groups of Companies from 1926-2007
Graph 1

Docket No. 080006-WS
Rothschild Exhibit No. ___(JAR-7)
Average Betas of 10 Groups

Beta	0.91	1.03	1.10	1.12	1.16	1.18	1.24	1.30	1.35	1.41
Historic Actual Compounded Annual Return	9.60%	10.90%	11.30%	11.10%	11.70%	11.70%	11.60%	11.80%	11.90%	13.60%

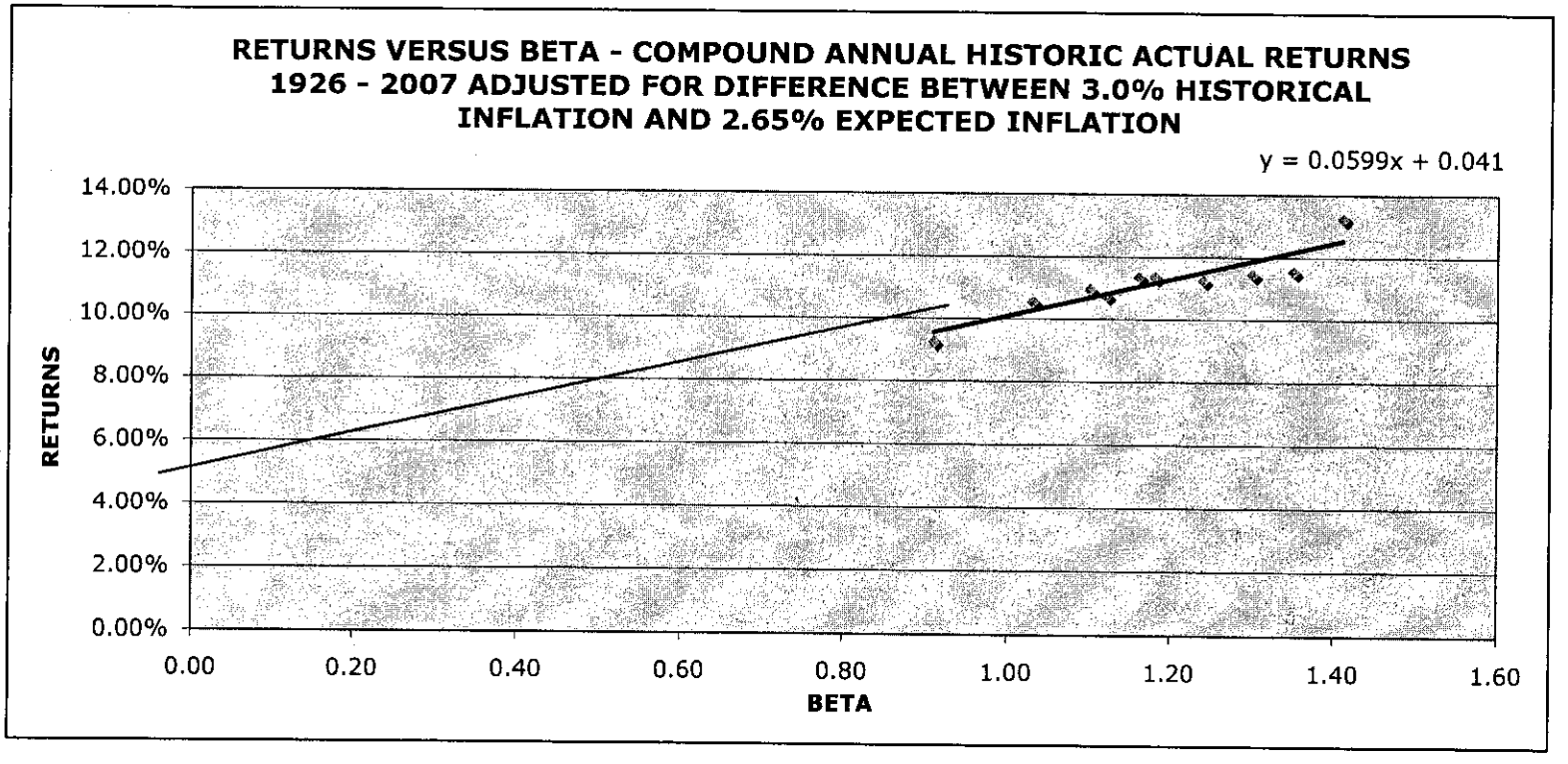


Source: Exhibit JAR- 3, page 2

COMPOUNDED ANNUAL EARNED RETURN AND BETA FOR THE GROUP OF COMPANIES
Adjusted for Inflation Differences
Graph 2

Docket No. 080006-WS
Exhibit No. ___(JAR-7)
Average Betas of 10 Groups

Beta	0.91	1.03	1.10	1.12	1.16	1.18	1.24	1.30	1.35	1.41
Reduced Compounded Annual Returns	9.25%	10.55%	10.95%	10.75%	11.35%	11.35%	11.25%	11.45%	11.55%	13.25%



Source: Exhibit JAR- 3, page 2

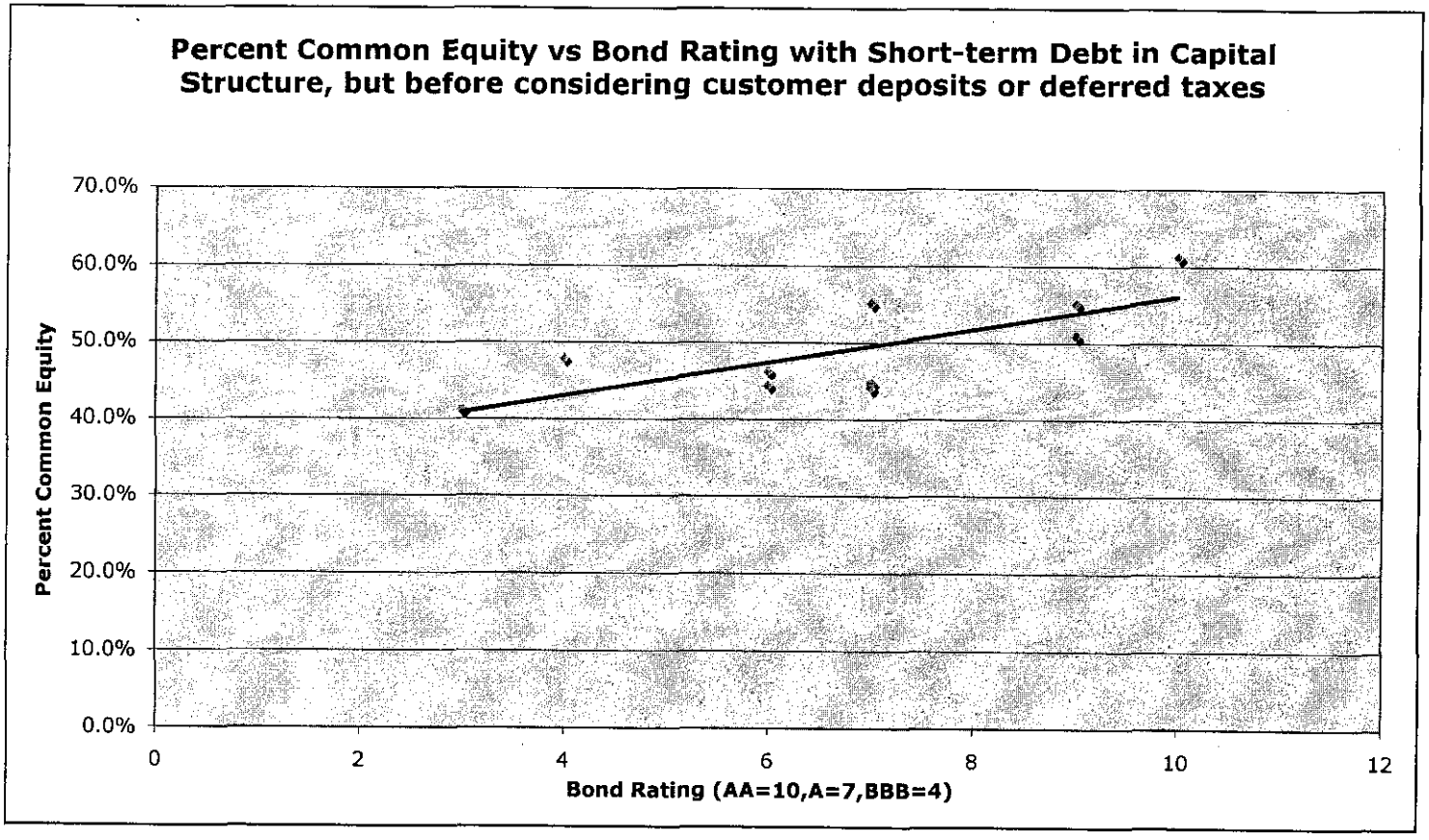
Average Common Equity Ratio Used by the Comparative Gas Companies
Actual Capital Structure

Docket No. 080006-WS
Exhibit No. ___(JAR-8)
ER of Comparative Gas Companies

	% Common Equity w/out Short Term Debt					($000,000s)	Quantity					Percentage			
Gas Companies	2003	2004	2005	2006	2007	Total Debt	LT Debt	ST Debt	Pfd Stock	Equity	Total Capital	LT Debt	ST Debt	Pfd Stock	Equity Ratio With ST Debt
AGL	49.7%	46.0%	48.1%	49.8%	49.8%	$ 1,885.0	$ 1,516.0	$ 369.0	$ -	$ 1,503.9	$ 3,388.9	44.7%	10.9%	0.0%	**44.4%**
ATMOS Energy Corp.	49.8%	56.8%	42.3%	43.0%	48.0%	$ 2,128.2	$ 2,119.7	$ 8.5	$ -	$ 1,956.6	$ 4,084.8	51.9%	0.2%	0.0%	**47.9%**
Equitable Res.*						$ 1,280.5	$ 1,253.5	$ 27.0	$ -	$ 1,100.0	$ 2,380.5	52.7%	1.1%	0.0%	**46.2%**
Laclede Group	49.4%	48.3%	51.8%	50.4%	54.6%	$ 527.4	$ 355.6	$ 171.8	$ 0.5	$ 428.3	$ 956.2	37.2%	18.0%	0.1%	**44.8%**
Nicor, Inc.	60.3%	60.1%	62.5%	63.7%	69.0%	$ 526.4	$ 373.4	$ 153.0	$ 0.6	$ 832.5	$ 1,359.5	27.5%	11.3%	0.0%	**61.2%**
N. W. Natual Gas	50.3%	54.0%	53.0%	53.7%	53.7%	$ 571.6	$ 512.0	$ 59.6	$ -	$ 593.8	$ 1,165.4	43.9%	5.1%	0.0%	**51.0%**
Piedmont National Gas	57.8%	56.4%	58.6%	51.7%	51.6%	$ 1,113.8	$ 824.8	$ 289.0	$ -	$ 879.3	$ 1,993.1	41.4%	14.5%	0.0%	**44.1%**
South Jersey Inds.	49.0%	51.0%	55.1%	55.3%	57.3%	$ 389.8	$ 357.9	$ 31.9	$ -	$ 480.3	$ 870.1	41.1%	3.7%	0.0%	**55.2%**
Southwest Gas	34.0%	35.8%	36.2%	39.4%	41.9%	$ 1,301.0	$ 1,263.6	$ 37.4	$ -	$ 911.3	$ 2,212.3	57.1%	1.7%	0.0%	**41.2%**
WGL Holdings	54.3%	57.2%	58.6%	61.5%	60.3%	$ 742.4	$ 597.4	$ 145.0	$ 28.2	$ 950.2	$ 1,720.8	34.7%	8.4%	1.6%	**55.2%**
Average	**50.5%**	**51.7%**	**51.8%**	**52.1%**	**54.0%**	**$ 10,466**	**$ 9,174**	**$ 1,292**	**$ 29**	**$ 9,636**	**$ 20,132**	**43.22%**	**7.48%**	**0.17%**	**49.12%**
											Median	**42.66%**	**6.77%**	**0.00%**	**47.05%**

Source: Most current Value Line at time of prep.

*Value Line does not provide a common equity ratio for Equitable Res
The amount of equity is directly from Value Line "Shr. Equity ($mill)"



Capital Structure Compared to Bond Rating	Bond Rating	Bond Rating Number for Graphing	Percent Commmon Equity
Gas Companies			
AGL	A-	6	44.4%
ATMOS Energy Corp.	BBB	4	47.9%
Equitable Res.*	A-	6	46.2%
Laclede Group	A	7	44.8%
Nicor, Inc.	AA	10	61.2%
N. W. Natual Gas	AA-	9	51.0%
Piedmont National Gas	A	7	44.1%
South Jersey Inds.	A	7	55.2%
Southwest Gas	BBB-	3	41.2%
WGL Holdings	AA-	9	55.2%

Source: Bond Ratings from Staff Request
Capital Structure from JAR 8, page 1

COMPARATIVE COMPANIES
SELECTED FINANCIAL DATA

	VL Issue	[1] Book Per Sh. Dec. 04 [A]	[2] Book Per Sh. Dec. 05 [A]	[3] Book Per Sh. Dec. 06 [A]	[4] Book Per Sh. Dec. 07 VL Est. [A]	[5] Market Price At 05/31/08 [B]	[6] Market Price High for Year [B]	[7] Market Price Low for Year [B]	[8] Market to Book At 05/31/08 [C]	[9] Market to Book Avg. for Year [C]	[10] Div. Rate [A]	[11] Dividend Yield At 5/31/2008 [D]	[12] Dividend Yield Avg. for Year [D]
AGL		$18.06	$19.29	$20.71	$21.74	$35.70	$42.80	$33.45	1.64	1.80	$1.68	4.71%	4.41%
ATMOS Energy Corp.		$18.05	$19.90	$20.16	$22.01	$27.39	$32.60	$25.00	1.24	1.37	$1.30	4.75%	4.51%
Equitable Res.		$7.17	$2.96	$7.78	$8.98	$70.23	$76.14	$44.57	7.82	7.20	$0.88	1.25%	1.46%
Laclede Group		$16.96	$17.31	$18.85	$19.79	$40.00	$41.57	$28.84	2.02	1.82	$1.50	3.75%	4.26%
Nicor, Inc.		$16.99	$18.36	$19.43	$20.58	$40.83	$47.47	$32.35	1.98	2.00	$1.86	4.56%	4.66%
N. W. Natual Gas		$20.64	$21.28	$22.01	$22.52	$45.59	$50.89	$40.98	2.02	2.06	$1.50	3.29%	3.27%
Piedmont National Gas		$11.15	$11.53	$11.83	$11.99	$27.03	$27.98	$22.00	2.25	2.10	$1.04	3.85%	4.16%
South Jersey Inds.		$12.41	$13.50	$15.11	$16.25	$38.25	$39.28	$31.20	2.35	2.25	$1.08	2.82%	3.06%
Southwest Gas		$19.18	$19.10	$21.58	$22.98	$31.18	$38.52	$25.14	1.36	1.43	$0.90	2.89%	2.83%
WGL Holdings		$16.95	$17.80	$18.28	$19.83	$34.89	$35.91	$29.79	1.76	1.72	$1.44	4.13%	4.38%
	AVERAGE	$15.76	$16.10	$17.57	$18.67	$39.11	$43.32	$31.33	2.45	2.37	$1.32	3.60%	3.70%
	MEDIAN								2.00	1.91		3.80%	4.21%

e= Estimated by Value Line

Sources:

[A] Most current Value Line at time of prep. of schedule. Most current quarterly dividend rate X 4
Note: For South Jersey Inds. There is no dividend for Q1 2008 so used 3Q 2007 X 1.10 X 4 (Note: never pay dividend in Q1, Q3 dividend have been increasing at an increasing rate (a bout 8% btw 2006 and 2007) Q4 has been about 2 X Q3

[B] Yahoo Finance -- Historical Prices, 5/31/08

[C] Market price divided by book value

[D] Dividend rate divided by market price

COMPARATIVE COMPANIES
EARNINGS PER SHARE AND RETURN ON EQUITY

	[1] EPS 2005	[2] EPS 2006	[3] EPS 2007 VL. Est.	[4] Return on Eq. 2006	[5] Return on Eq. 2007	[6] Value Line Future Exp. Return on Eq.	[7] Return on Equity 2005
	[A]	[A]	[A]	[B]	[B]	[A]	[B]
AGL	$2.48	$2.72	$2.72	13.60%	12.82%	13.00%	13.28%
ATMOS Energy Corp.	$1.72	$2.00	$1.94	9.99%	9.20%	9.50%	9.06%
Equitable Res.	$1.75	$1.86	$1.49	34.64%	17.78%	21.50%	34.55%
Laclede Group	$1.90	$2.37	$2.31	13.11%	11.96%	11.50%	11.09%
Nicor, Inc.	$2.27	$2.87	$2.99	15.19%	14.95%	14.00%	12.84%
N. W. Natual Gas	$2.11	$2.35	$2.76	10.86%	12.40%	11.00%	10.07%
Piedmont National Gas	$1.32	$1.28	$1.40	10.96%	11.75%	12.50%	11.64%
South Jersey Inds.	$1.71	$2.46	$2.09	17.20%	13.33%	14.50%	13.20%
Southwest Gas	$1.25	$1.98	$1.95	9.73%	8.75%	10.00%	6.53%
WGL Holdings	$2.11	$1.94	$2.10	10.75%	11.02%	10.50%	12.14%
	$1.86	$2.18	$2.18	14.60%	12.40%	12.80%	13.44%
				12.03%	12.18%	12.00%	11.89%

e= Estimated by Value Line

Source:

[A] Most current Value Line at time of prep. of schedule.

[B] Earnings Per Share divided by average book value. Book value shown on

0.00%

RETURN ON EQUITY IMPLIED IN
ZACKS NEXT FIVE YEAR GROWTH RATES

		Dec. 07 Y/E Book [3] [A]	Earnings 2007 [A]	Dividends [A]	Analyst 5 Year Growth Rate 10/ [B]	Y/E Book in 2011 at Zack's Growth [C]	Y/E Book in 2012 at Zack's Growth [C]	Earnings 2012 at Zack's Growth [C]	Return on Equity to achieve Analysts' Growth [C]	VALUE LINE BETA [A]
AGL	ATG	$21.74	$2.72	$1.68	4.80%	$26.42	$27.74	$3.44	12.70%	0.85
ATMOS Energy Corp.	ATO	$22.01	$1.94	$1.30	5.30%	$24.93	$25.76	$2.51	9.91%	0.85
Equitable Res.	EQT	$8.98	$1.49	$0.88	9.80%	$12.08	$13.05	$2.38	18.92%	0.95
Laclede Group	LG	$19.79	$2.31	$1.50	10.00%	$23.93	$25.23	$3.72	15.14%	0.90
Nicor, Inc.	GAS	$20.58	$2.99	$1.86	5.20%	$25.72	$27.17	$3.85	14.57%	0.95
N. W. Natual Gas	NWN	$22.52	$2.76	$1.50	6.20%	$28.39	$30.09	$3.73	12.75%	0.80
Piedmont National Gas	PNY	$11.99	$1.40	$1.04	6.00%	$13.66	$14.14	$1.87	13.48%	0.85
South Jersey Inds.	SJI	$16.25	$2.09	$1.08	7.90%	$21.16	$22.64	$3.06	13.96%	0.85
Southwest Gas	SWX	$22.98	$1.95	$0.90	8.00%	$28.09	$29.63	$2.87	9.93%	0.90
WGL Holdings	WGL	$19.83	$2.10	$1.44	7.30%	$22.99	$23.93	$2.99	12.73%	0.90
		$18.67	$2.18	$1.32	7.05%	$22.74	$23.94	$3.04	13.41%	0.88
					6.75%				13.11%	0.88

Source:
[A] Must Current Value Line at time of prep of schedule
[B] Zacks.com, 5/29/08
[C] Projected return on equity is obtained by escalating both dividends and earnings per share by the stated growth rate, and adding earnings and subtracting dividends in each year to determine the book value.

TABLE 1

DIFFERENT GROWTH RATES	**Value**	**Growth**
Earnings Per Share	$ 1.00	6%
Dividends Per Share	$ 0.60	3%
Book Value Per Share	$ 10.00	4%
Stock Price	$ 11.00	6%

Growth at 6% per share	**2007**	**2008**	**2009**	**2010**	**2011**
Earnings Per Share	$ 1.06	$ 1.12	$ 1.19	$ 1.26	$ 1.34
Dividends Per Share	$ 0.62	$ 0.64	$ 0.66	$ 0.68	$ 0.70
Book Value Per Share	$ 10.40	$ 10.82	$ 11.25	$ 11.70	$ 12.17
Stock Price	$ 11.66	$ 12.36	$ 13.10	$ 13.89	$ 14.72
Dividend Yield	**5.30%**	**5.15%**	**5.00%**	**4.86%**	**4.73%**
Market to Book Ratio	1.12	1.14	1.16	1.19	1.21
Return on Book Equity	**10.19%**	**10.39%**	**10.59%**	**10.79%**	**11.00%**
P/E Ratio	11.00	11.00	11.00	11.00	11.00

Table 2

Growth at ROE X Retention Rate	**Value**	**Growth**
Earnings Per Share	$ 1.00	4%
Book Value Per Share	$ 10.00	4%
Stock Price	$ 11.00	4%
Dividends Per Share	$ 0.60	4%

Growth at 6% per share	**2007**	**2008**	**2009**	**2010**	**2011**
Earnings Per Share	$ 1.04	$ 1.08	$ 1.12	$ 1.17	$ 1.22
Book Value Per Share	**$ 10.40**	**$ 10.82**	**$ 11.25**	**$ 11.70**	**$ 12.17**
Stock Price	$ 11.44	$ 11.90	$ 12.37	$ 12.87	$ 13.38
Dividends Per Share	$ 0.62	$ 0.65	$ 0.67	$ 0.70	$ 0.73
Dividend Yield	5.45%	5.45%	5.45%	5.45%	5.45%
Market to Book Ratio	1.10	1.10	1.10	1.10	1.10
Return on Book Equity	10.00%	10.00%	10.00%	10.00%	10.00%
P/E Ratio	11.00	11.00	11.00	11.00	11.00
Book Value Per Share Calculated	**$ 10.40**	**$ 10.82**	**$ 11.25**	**$ 11.70**	**$ 12.17**
Growth Rate					

EXTERNAL FINANCING RATE
(Millions of Shares)

S&P GAS DISTRIBUTION UTILITIES COMPANY WITNESS GROUP	Common Stock Outstanding 2007	2011-13	Compound Annual
AGL	76.40	80.00	1.16%
ATMOS Energy Corp.	89.33	115.00	6.52%
Equitable Res.	122.16	119.00	-0.65%
Laclede Group	21.65	25.50	4.18%
Nicor, Inc.	45.90	46.00	0.05%
N. W. Natual Gas	26.41	28.00	1.47%
Piedmont National Gas	73.23	72.00	-0.42%
South Jersey Inds.	29.61	32.00	1.96%
Southwest Gas	42.81	48.00	2.90%
WGL Holdings	49.45	50.00	0.28%
		Average	1.74%
		Median	1.32%
		Round to	**1.75%**

External financing rate adjusted for change in common equity ratio

Source: Most current Value Line at time of prep. of schedule.